

A POINT SCALE OF PERFORMANCE TESTS

VOLUME I
CLINICAL MANUAL

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OF PERFORMANCE
TESTS

LONDON
GEOFFREY CUMBERLEGE
OXFORD UNIVERSITY PRESS

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VOLUME I
CLINICAL MANUAL

SECOND EDITION
(Revised)

BY
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NEW YORK
THE COMMONWEALTH FUND
1943

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REVISED EDITION
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FIRST PRINTING, JUNE, 1943
SECOND PRINTING, NOVEMBER, 1944
THIRD PRINTING, FEBRUARY, 1946
FOURTH PRINTING, MAY, 1947

PUBLISHED BY THE COMMONWEALTH FUND
41 EAST 57TH STREET, NEW YORK 22, N.Y.

PRINTED IN THE UNITED STATES OF AMERICA
BY E. L. HILDRETH & COMPANY, INC.

ACKNOWLEDGMENTS TO THE FIRST EDITION

IT WOULD be no small task to thank to my own satisfaction all the people who have helped in the work of standardizing this point performance scale.

The Commonwealth Fund, by means of a grant of \$5,000, made it possible to undertake the project. Lotus D. Coffman, President of the University of Minnesota, permitted the grant to be made through that university. R. M. Elliott, Chairman of the Department of Psychology, took the project under the wing of his department, and made many timely suggestions as to ways and means.

In obtaining subjects and their hearty coöperation, I am indebted to the Department of Education of St. Paul, especially to L. L. Everly, Director of Research, and to the following principals of public schools in which tests were given: Edith B. Taylor, Jessie Whitman, Arthur N. Gausemal, Dietrich Lange, James E. Marshall, and Franklin H. Thomas. Nina Whitman of the Hancock School, Katherine Tschida of the Mechanic Arts High School, and Henry W. Teichreow of the Vocational School supplied additional data in regard to the pupils tested.

M. E. Haggerty, Dean of the College of Education of the University of Minnesota, permitted the use of University High School pupils as subjects. Charles E. Boardman, Principal of the University High School, was helpful in smoothing the path of the examiners.

Sister Louis Bertrand, Principal of St. Mark's Parochial School, provided a goodly number of subjects for whom Binet mental ages were available, as did also Virginia Rice, Superintendent of the Wilder Day Nursery, and Margaret Weikert, Superintendent of the Children's Preventorium.

Without the coöperation of the teachers who submitted cheerfully to interruption of class work, and of the many children who by their enthusiasm and spontaneity relieved the drudgery of routine testing for the examiners, the task could never have been satisfactorily completed.

Dr. M. L. Stiffler, Director of the Child Guidance Clinic of St. Paul, was of great help in meeting practical situations as they arose. F. Kuhlmann and Donald G. Paterson have given detailed criticism of methods and of the presentation of results.

Most of the testing and much of the statistical work was done by Alverta Buchta and Karla Jorgenson. The former was engaged full time on the project; the latter, part time. Together we worked out the procedure

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for giving and scoring the separate tests. These procedures were in every case based upon the instructions used by other investigators. For permission to incorporate much of their material into the present work, I am under obligation to Rudolph Pintner, Donald G. Paterson, and Margaret M. Anderson, and to their publishers, D. Appleton and Company, and Warwick and York; to S. C. Kohn and his publishers, the Macmillan Company; to S. D. Porteus, and to William Healy. James P. Porter has been generous in giving his permission for the reprinting of the part of this report which made its first appearance in the *Journal of Applied Psychology*, as well as the part of the instructions for the Healy Pictorial Completion Test II which I have had occasion to quote.

One is encouraged to believe that a project in which so many have been interested cannot be without value.

G. A.

ST. PAUL, *February, 1930*

FOREWORD TO THE SECOND EDITION

THIS revision of Volume I is undertaken in order to clarify instructions for specific tests of Form I of the Point Scale of Performance Tests and to incorporate new material on the usefulness of the scale for testing pupils in the Indian schools of the United States, on results obtained in testing the deaf, and on the use of the tests in cases of "congenital word blindness." Also, as a result both of first-hand experience with Form I and suggestions from other psychologists, it seemed advisable to construct norms omitting the Casuist Form Board and the Manikin-Feature-Profile Test. These norms are presented in this revision.

The data used for analyzing the responses of deaf subjects were supplied by Helen Bishop, psychologist in the St. Paul Public School system, and Dora Capwell of the Bureau of Psychological Service of the State of Minnesota. For the opportunity to work with Indian pupils, acknowledgment is made with pleasure to the members of the staff of the Indian Service in the State Office and at the Red Lake Reservation in Minnesota, and at the Haskell Indian School, Lawrence, Kansas.

Form I of the scale has been so consistently superior to Form II that a thoroughgoing revision of Form II is now being undertaken through a grant from the Amherst H. Wilder Charity, of St. Paul; and all discussion and data about Form II which appeared in the first edition of this clinical manual are therefore omitted in this second edition.

For additional quantitative data and for information in regard to the original standardization of the Point Scale of Performance Tests, the reader is referred to Volume II.

G. A.

ST. PAUL, *January, 1943*

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THE SCALE AND ITS USES

THE Point Scale of Performance Tests was built in response to a general need for a non-verbal scale that could be used satisfactorily in clinical work. The psychological clinician must resort frequently to the use of performance tests in cases where the highly verbalized Binet tests are inadequate, first, because of foreign language handicap; second, because of speech or hearing defect; third, because the Binet scale fails to give an adequate report of the intelligence of the individual in whom verbal and non-verbal abilities are markedly unequal in their development.

In attempting to employ performance tests, however, the clinician is confronted with a number of serious difficulties. Many non-verbal tests are available, but comparatively few possess any high degree of discriminative value. When the best of these are selected, one is then faced with the difficulty of comparing results from the separate tests. They have been standardized against different populations. From one set of norms all subnormal and unstable cases have been excluded. For another, we have no indication of the selection of cases. For a third, a definite percentage of feeble-minded are included. Obviously, we cannot compare the scores of a patient on tests standardized against three such groups with any assurance that a difference in rating will indicate any real difference in ability. Moreover, even with a satisfactory selection of tests and adequate standardization, a method of combining results from the separate tests is needed which on non-verbal tests will yield a final rating comparable to the Binet mental age and serving as wide a purpose.

It was in the attempt to overcome some of these difficulties and to develop a non-verbal scale, in the results of which the clinician could have confidence as in those of the Binet, that this project was undertaken.

STANDARDIZATION

The Point Scale of Performance Tests in its present form is the result of the work of a number of years. Work on the methodology was begun in 1917 under the direction of Herbert Woodrow, then of the Department of Psychology of the University of Minnesota. The results from that study were published under the title, "An Absolute Intelligence Scale: A Study in Method."¹ As the method gave promise of further

¹ Arthur, Grace, and Woodrow, Herbert, "An Absolute Intelligence Scale: A Study in Method," *Journal of Applied Psychology*, III, 2 (June, 1919), 118-137.

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usefulness, work was continued with the same tests on a larger group of subjects. These results were reported under the more modest title, "A Group Point Scale for the Measurement of Intelligence."² The PE of measurement according to Nygaard's formula between the intelligence quotients obtained with that scale and those of the Kuhlmann-Binet for 275 children was 2.60. Evidently, the method had value.

The next step was the application of this method to existing data on non-verbal tests. A tentative scale³ was constructed, the success of which I have never been able wholly to understand. It had everything the matter with it: many of the tests were only partially standardized; they were standardized against different populations, and in some cases "six years" meant 6.0, while in others it meant 6.5 years. But in spite of these glaring faults, it worked surprisingly well; well enough to justify an adequate standardization of the scale as a whole. A preliminary report of the results of the re-standardization of the scale was published in June, 1928.⁴

The report of this original standardization is published in two volumes. This book, Volume I, is intended as a clinical manual. From it has been excluded everything not of immediate use in the daily routine of the psychological examination. Of the various sets of norms obtained, only the chronological age norms are included in this volume, as these are the ones for which the clinician will have daily use. Volume II is intended for those who are interested in the details of scale construction. In it is given a full account of the work of standardization, together with alternative forms of scoring and their results. Binet mental age norms and sex norms also are supplied in Volume II.

The scale was standardized with two sets of tests judged to be fairly comparable, Form I and Form II, the latter to be used in the re-examination of subjects who had been tested with Form I. However, as stated in the Foreword, Form I has appeared to be so consistently superior that a thoroughgoing revision of Form II has been made and is now in process of standardization. Data on the original standardization of Form II are therefore omitted from this second edition of the clinical manual.

The chronological age norms for Form I of the scale were based upon

² Arthur, Grace, "A Group Point Scale for the Measurement of Intelligence," *Journal of Applied Psychology*, X, 3 (June, 1926), 228-244.

³ Arthur, Grace, "A New Point Performance Scale," *Journal of Applied Psychology*, IX, 4 (December, 1925), 390-416.

⁴ Arthur, Grace, "The Re-standardization of a Point Performance Scale," *Journal of Applied Psychology*, XII, 3 (June, 1928), 278-303.

the scores of about 1,100 public school children of a good middle-class "American" district.

GENERAL CLINICAL APPLICATIONS

The scale in its present form is intended as a clinical instrument to be used by adequately trained clinicians in psychological and psychiatric clinics. It is hoped that its use will be limited to such clinics, as many of the tests, owing to a puzzle element, are especially susceptible to practice effect. The simple, game-like form of the tests renders them attractive to patients of all ages.

From a number of different angles, this scale has proved its usefulness. Its primary value is to supplement the Binet rating. This supplementary rating is of value in diagnosis whether it confirms the Binet rating, as it does in the majority of cases, or whether it shows an unequal development between verbal and non-verbal abilities. In the latter case, a complete re-examination should be made a year later (using an alternate form of the Point Scale of Performance Tests when it becomes available) to determine whether the difference in rating on the two scales was a true one, or only an accidental difference due to lack of reliability on the part of either or of both scales. For fifty per cent of the cases tested on Form I, the IQ falls within five points of the IQ obtained on either the Kuhlmann-Binet or the Stanford-Binet scale. This means that results obtained with this form of the performance scale agree almost as closely with those obtained with either of these Binet scales as Stanford-Binet IQ's agree with retests on the Stanford-Binet scale.⁵

Although the main purpose of this scale is to supplement the Binet rating, it is also of definite value in helping clinicians to understand and to deal effectively with a number of different conditions that are met with among clinic patients.

For some patients, the performance scale ratings tend to vary markedly from their Binet ratings. John earns high marks at school and has received three special promotions. His Stanford Achievement Test rating yielded an EQ of 133. On Form I of the performance scale he earned an IQ of 86. The school reported him as brilliant. The boys considered him a "nut." The director of his group at the Y.M.C.A. agreed with the boys. John could not compete with those of his own kind in a single boy-

⁵ Terman, Lewis M., *Intelligence of School Children* (Boston: Houghton Mifflin Company, 1919), p. 142.

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ish activity. He was as truly dull in that field as he was bright in the classroom. For individuals of his sort, either a Binet rating or a performance scale rating will tell only part of the story.

Illustrating the same point from a different angle is Billy. He is a well-grown ten-year-old boy, free from any gross physical defects. He is good-natured and friendly. He gets along well with boys of his own age, and is among the leaders of his group. He is a steady worker. His teacher cannot understand why a boy who tries so hard and seems so capable should be so hard to teach. At the age of eight years, Billy could not read at all in spite of regular school attendance. His Binet IQ proved to be 76. On the performance scale, however, he earned an IQ of 99. At the end of two years of faithful effort, he earned a grade rating of "End of Low I" on the Gray Oral Reading Test. On the Stanford Achievement Test, his grade standing in reading was II.6. Billy was placed in a special class for the subnormal, because he could not learn in the ordinary classroom. In making future plans for Billy, however, we need to remember that he is subnormal only in spots, and that outside of the field of the Three R's with their various ramifications, he can probably compete successfully with other boys of his own age. Here again, either the Binet rating alone, or the performance rating alone, would be misleading. For Billy is no more a typically subnormal boy than he is a wholly normal one.

The non-verbalistic individual is likely to do his best work in a psychological examination on the performance scale. As more and more language enters into the tests used, his ratings drop lower and lower. The oral vocabulary test finds him floundering helplessly. There, he not only has to recognize the words presented, but is also obliged to find other words with which to express his meaning. One boy was doing outstandingly good work in a course in cabinet-making, but was failing in the language course that was related to it. When he was questioned about his difficulty, he answered: "When they tell me to do something, I can do it all right and get a good mark on it. But when they tell me to stand up and tell what I've done, I'm sunk!" This was far from being a hopeless situation. Skilled instruction and persistent effort on the part of the boy enabled him to complete the course in creditable fashion.

The antithesis of the individual just described is the patient of the verbalistic type who talks fluently, picks up new words and phrases without effort, memorizes textbook material in a way that delights the souls of his teachers, but does not do so well when independent thinking is required. This type of individual earns his highest scores on the academic tests of learned material, succeeds next best on the Terman vo-

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cabulary test, and next best to that on the Stanford-Binet scale which is largely influenced by learned material. He meets with difficulty the new situations of the performance scale. One boy of this type found school work smooth sailing until he reached high school mathematics and laboratory sciences. By working harder than the other pupils he managed to get a passing grade in mathematics, but he found to his alarm that he was failing in chemistry. He could pass the tests based on the material in the textbook, but his notebook was unsatisfactory, and his experiments refused to turn out according to prediction. Examination revealed good work habits and an adequate foundation in drill subjects. He had always expected and received sympathetic treatment from teachers. The chemistry teacher was no exception. This boy earned an IQ of 120 on the Stanford-Binet scale. But on the Point Scale of Performance Tests his IQ was only 90 in spite of a good working attitude, and a complete lack of any realization that his work was any less satisfactory on this scale than on the Binet. He was advised to drop chemistry at once, and to avoid laboratory science and advanced mathematics in order to preserve his good academic record. He did so, and had no further school difficulty.

A more extreme illustration of the type that memorizes readily but thinks with difficulty is a patient with delayed speech who did not begin to talk until he was nearly four years old. For some time, speech was limited to repeating the names of objects as they were told him. From that he went on to repeating phrases and sentences. By that time he was recognized as a well-developed case of echolalia. It took a full year of patient effort to teach him to answer a simple question instead of merely repeating it. But it was clear that this repeating tendency could be utilized. So when he was excluded from kindergarten because he could not keep up with the activities of the group, he was promptly turned over to a tutor and started on the path of the Three R's. It was a great satisfaction to the mother at the end of the school year to have her child, who had been considered too immature for kindergarten, reading better than other children of the neighborhood who had been in the first grade throughout the school year. She needed to get what satisfaction she could from this fact, as the child still had great difficulty in managing any kind of social contacts. The reading was mostly word-naming, with little comprehension of any but the simplest material. His Binet rating was low average, IQ 86, but the Point Scale of Performance Tests rated him as definitely feeble-minded with an IQ of 61.

Although the teaching of this type of child to read may seem at first thought to be of little value, it offers recreation to the child and satisfac-

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tion to the family, both of which are of value in improving adjustment within the family group. The methods used in this kind of teaching are, of course, quite different from those used for children with specific reading disabilities.

The performance score contributes a valuable corrective to the Binet rating in cases where environmental conditions have varied widely from those of the average child. In children of obviously low-grade intelligence from families of good social standing, one occasionally meets a condition of over-training that results in a Binet score that is misleading. In such cases the Binet rating tends to reflect the environment, while the performance rating gives a safer index of the ability of the child to meet new situations. The converse of this is the case of the child who has been shifted around from place to place without being permitted to stay in any one environment long enough to make a satisfactory adjustment. He may make a poor showing on the Binet tests, but meet adequately the situations of the performance scale.

In cases where a valid Binet rating cannot be obtained because of language difficulty, speech defect, or emotional repression, the performance scale rating can be used as a substitute. Care should be taken, however, to verify the original findings by a retest, six months or a year later (with an alternate form of the scale when it becomes available). It should be remembered (see Volume II) that Italian children tend to rate significantly higher on the performance scale than on the Binet, and that Jewish children, on the contrary, tend to do better on the Binet scales. Care must be taken with the non-English-speaking Italian child, therefore, not to overrate his general ability on the basis of his performance scale rating. It is equally necessary to guard against underrating the ability of the non-English-speaking Jewish child because of his poor performance score.

It has been found that individuals earning a high score on the Point Scale of Performance Tests frequently tend to be well adjusted, while those doing conspicuously poor work on this scale are often seriously maladjusted. The cause and effect relationship is not clear. It seems possible, however, that the well-adjusted individual is well adjusted at least in part because of his day-by-day and minute-by-minute success in dealing with his environment of inanimate things.

An interesting study of the relationship between ratings on the Point Scale of Performance Tests, the Binet scale, success in shop work, achievement in academic subjects and estimated degree of adjustment or

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maladjustment has been published by Sidney Bijou of the Wayne County Training School.⁶

Extreme emotional trauma like extreme physical illness can be expected to interfere with adequate response of any kind.

In cases of acute emotional disturbance, care must be taken not to accept at face value the rating of either the performance scale or the Binet scale. Blanche affords an illustration of this situation. She was an unmarried mother. She was as physically immature in most respects as other thirteen-year-old girls. Her baby was two months old. It was dying, slowly and unpleasantly. She was sentenced to watch it. When brought to the clinic for examination, Blanche earned a Binet IQ of 80, and a performance IQ of 67. Neither rating agreed with the school report of "very bright." She had been advanced one year beyond other girls of her age. It seemed possible that her lack of success on these scales might be the result of the emotional stress which she was suffering, and that although she was obviously unable to meet new situations adequately in her present emotional state, she might have better success in giving out material previously learned. A Stanford Achievement Test was given, therefore, with results that justified both the school history and the precaution against judging an emotionally disturbed patient on the basis of ability to meet new situations. The fact that the Binet rating and the performance scale rating corroborated each other to some extent in this case probably meant nothing more than that the patient was no better able to meet the new situations presented by the one scale than she was to meet the new situations presented by the other.

Fear, however, does not always act to the detriment of a score. Occasionally a dull or stolid child will experience just enough fear of the new situation in which he finds himself to induce him to make a degree of effort that he is quick to abandon as soon as he becomes at ease. Some children, who have been examined prior to admission to the local tuberculosis preventorium, have earned ratings that they have never been able to equal on subsequent re-examinations. This is of academic interest rather than practical value, as we have no way of knowing which patients are among the very few individuals upon whom mild fear acts as a stimulant, and even if we did, we would still be in the dark as to the exact

⁶ Bijou, Sidney W., "An Experimental Analysis of Arthur Performance Quotients," *Journal of Consulting Psychology*, VI, 5 (September-October, 1942), 247-253.

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amount that could be expected to act as a stimulant, or at what degree it would begin to interfere with effective reaction.

For clinic patients, the performance scale, in addition to the rating it supplies, serves a most useful purpose as a shock absorber. It provides an opportunity to make a satisfactory contact with the patient, and to convince him that he is working in a friendly, non-faultfinding atmosphere. He finds the material interesting. Self-confidence is induced, inasmuch as failure is less evident, and can be more easily rationalized for him than on any of the Binet scales. Transfer from the non-verbal material of this scale can be made to the Binet material without loss of rapport, and verbal responses can be obtained in this way from patients who have refused to give adequate coöperation in other test situations. Rose offers an example of the scale as a means of contact-making.

She was a shy, repressed, adolescent girl who had been referred to the clinic because of her refusal to talk either at home or at school. She did well in written work at school, but refused obstinately to take any part in recitations or class discussions. Investigation revealed the fact that Rose belonged to a large, noisy, demonstrative family. Her shyness and reserve had been aggravated by teasing from the immediate family, and by unfavorable comment from friends and relatives. The mother dreaded the clinic study, for fear the patient would be judged a "dumb-bell" on the basis of a refusal to respond.

Rose arrived at the clinic in a somewhat defensive mood. She did not intend to be made to talk. She was conducted to a table in the examining room, and put to work on the performance scale. The briefest instructions were given. They were given in a tone so low that several times she had to ask to have them repeated. The expected position was thus reversed: she was put in the position of the questioner, instead of that of the one to be questioned. After a time she began to make spontaneous comments on the various test situations. By the time the performance scale was completed, a normal conversation was being carried on, and a Binet examination could be given with the assurance of her full co-operation.

The chief advantages of the performance scale as a shock absorber lie in the apparent simplicity of the material, and in the fact that no verbal response is demanded. Working under conditions where no speech is required for forty-five minutes or an hour frequently results, as with Rose, in spontaneous speech on the part of shy, self-conscious patients.

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As stated above, the performance scale provides also an excellent opportunity to observe the behavior of patients in a variety of situations. Sometimes we find a slow change of "mental set," resulting in slow adjustment to new situations. This is of great importance in dealing with some types of problems, especially those of foster home placement. Roy is the outstanding clinic example of this kind of difficulty. He was an adoptive failure. He had been tried in four good homes, but each one had asked to have him removed, as he was unresponsive and failed to fit into the family group. He had accepted everything that had been done for him, without comment and without any apparent emotion. Moreover, his school work was unsatisfactory. The family history was most unpromising. The clinic was prepared to find him an "unplaceable" child. When he arrived for examination, we saw, to our surprise, an attractive twelve-year-old boy. He was thin and worried looking, but his general appearance was pleasing, and his manner was friendly. Why couldn't so promising a specimen make a satisfactory adjustment in any of these rather exceptional homes that had been offered him?

In watching his work on the performance scale, it was noted that though he had no difficulty in understanding the various tasks as they were presented, he took so long in adjusting to each new task that his score was poor—this, in spite of the fact that he was doing more than satisfactory work for a boy of his age on the more difficult end of the scale. He earned a Binet IQ of 110. Yet he was not making a satisfactory school adjustment. The placing agency was interviewed. It was advised to keep Roy until a suitable home could be found that would be willing to keep him for a fairly long time, whether he was liked or not. This was done. A home was found that seemed to meet these conditions. But three weeks after the placement, the report from this new home, too, was unsatisfactory. The foster parents wanted him removed. He was accomplishing nothing in school. However, at the end of two months the home found him tolerable, and the school was recognizing that he had possibilities. At the end of four months he returned to the clinic for an interview. He had gained six pounds. The worried look was gone. The foster parents liked him and wanted to keep him. The school reported his work as very satisfactory. He was well liked by the other children. He had needed not only time to adjust to the new situation, but sympathetic understanding of his difficulty in making the adjustment.

A different type of behavior observable in work with the performance scale is that of a child referred to the clinic for "obstinacy." Here was

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found a slowness in comprehending the various tasks, that was in marked contrast to the ability to perform them once they were understood. Slowness of attack had been interpreted as unwillingness to attempt tasks, and the child had been scolded and punished for refusal to obey. Comprehension was then still further interfered with by self-distrust and fear of punishment. One child who had been returned from two foster homes for this kind of "obstinacy" made a successful adjustment in the receiving home after her behavior had been explained, and has adjusted well in the foster home in which she has since been placed.

Other characteristics of behavior that are most readily observed in work with the performance scale are a tendency to persevere in the face of difficulty, or to give up too easily; to conform to the rules of the game or try to "get by" with slight irregularities; to stammer in some situations and not in others. Stammerers whose trouble began upon school entrance will often complete work on the performance scale talking freely without a trace of stammer, but begin to stammer violently if work on the Stanford-Binet scale is attempted.

In many of these cases cited as illustrations, any other set of non-verbal tests would furnish equally good opportunities for observing the behavior of the patient. The important thing is to keep the tests the same, and conditions as nearly constant as possible in order that the behavior may be observed under conditions that are similar for all patients.

In addition to the general types of reactions already noted, specific tests of this performance scale have given evidence of usefulness in bringing to light tendencies to react in ways which need to be considered both in diagnosis and in planning therapy.

On the average, individuals do slightly better on the second presentation of the Knox Cube series, given at the end of the examination, than on the first series, given at the beginning. Any wide deviation from this pattern may be significant. A frightened child, or one who is slow in adjusting to new situations, may do very poorly on the first trial, but on the second giving of the series may earn a score commensurate with his mental age on the scale as a whole. A child of a contrasting type exerts himself to make a good first impression and does well the first time the series is presented, but after an hour of work with the examiner may feel so at ease that he lapses into his usual careless attention habits.

In explaining the results of the Knox Cube Test to older children after giving the series the first time, they frequently are told that they are showing what good attention they can pay to a job that is not very inter-

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esting. They are shown their scores, and told that they are good in cases where there has been no obviously careless error. When successes and failures alternate in such a way as to suggest carelessness, patients are told that they will probably do much better on the second trial, as they now understand much more clearly what the test is all about. This often results in more serious effort on all the other tests of the scale.

The Seguin Form Board, for all but very young children, measures speed of reaction on an easy task. A very poor score on both this and the Mare and Foal Test, as compared with work on the rest of the scale, indicated for the deaf children of the St. Paul Public Schools that they had probably failed to comprehend that speed was an essential factor in the tasks presented. For children who understand the requirements, disproportionately low scores for these tests as compared with those of the rest of the scale may indicate a lethargic condition following an encephalitis, as it did in one case, or a metabolic rate low enough to demand the attention of a physician.

In the case of one little boy who had earned a Binet IQ of 100 on an earlier examination, the slow reaction on these two tests gave the first clue to the reason for his failing school work. On a retest with the 1916 Stanford-Binet scale, an IQ significantly lower than the first one was obtained. Reactions during the test at the ten-year level of attempting to name sixty words in three minutes suggested extreme psychomotor retardation. Only on the vocabulary test was he able to earn a score at all commensurate with his earlier rating. It was found upon questioning the mother that the child had recently begun to gain weight very rapidly. There was nothing to indicate emotional upset of any kind, except irritability when he was expected to make any physical exertion. A basal-metabolism test confirmed the picture the tests had outlined. Glandular therapy under the supervision of a physician quickly restored him to normal condition. A subsequent re-examination showed normal speed for his age, and a Binet IQ returned to the level of the first examination.

Shy young children and nervous (frequently delinquent) adolescents are sometimes afraid to close their eyes during the arrangement of the form-board material, and so the turning of the head was substituted. The behavior of the patient during this procedure is sometimes significant. It is very rare for a child to try to peep or to cheat in any other fashion during the giving of this scale. Frequent occurrence of such attempts on the part of patients would suggest something radically wrong in the approach. Some maladjusted children, when they see the form-board material and suspect it of being difficult, begin promptly to rationalize before

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making any attempt to perform the task. "There are too many pieces. They won't all go in there," or "There aren't enough pieces." If he adds "You took some of them," not in fun, but seriously, his response is as significant as attempts at cheating, and just as rare. This is likely to be the child who is afraid the mother will slip out and leave him alone in a strange situation in spite of promises to wait. Before any therapy can be undertaken for such children, it is necessary to find someone in their environment whom they can trust. Sometimes a tutor or nurse has to be introduced into the picture. In extreme cases, a totally different environment has to be provided through either foster home or institutional placement.

For some reason, the Healy Picture Completion Test I seems to be useful in indicating language ability or the lack of it. When an adolescent who makes a high score on this test reports that he is getting poor marks in his English class, it is almost always found that he is not turning in the required book reports or term papers, or that he is lowering his grades by careless mechanical errors.

The Porteus Maze Test offers excellent opportunity to observe the willingness as well as the ability of patients to conform. Some are conscientious in the extreme. Some conform most of the time, but occasionally forget. Some conform only when they think they are being watched. One attractive little boy was obviously in the habit of doing pretty much as he pleased. He would deliberately break a rule, and then "make everything right" with an elaborate apology. The habitual runaway from home or from school frequently advertises this tendency by dashing blindly into successive mazes. The child who sometimes reacts impulsively but is under no compulsion to do so may start bolting into blind alleys, but when he finds that this does not succeed, settles down and plans his way out. It has been found that this latter type of reaction frequently marks off the more workable case from the one that is less likely to respond to treatment. Some patients start out planning their way carefully, but discard this method as soon as the task becomes difficult. These, as well as the consistently poor planners, are advised always to discuss their plans with some adult whom they can trust. It has long been noted by examiners that the too-careful child is likely to be an over-anxious child.

The Kohs Block Design Test yields mental age ratings that agree more closely with the mental ages obtained with the 1916 Stanford-Binet scale than any other test of the Point Scale of Performance Tests. In addition to this, an exceptionally high rating on the Kohs Block Design

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Test provides a good basis for selecting candidates for special instruction in art. In one instance, it seemed to be failing to do its work in this regard. A boy was taken into court on a minor charge. While he was waiting for his case to be called, he amused himself by drawing. He made some interesting sketches. They were bizarre, but seemed to show promise of ability. He was given a complete psychological examination. He again employed a few minutes that he had to himself in sketching. Again, the sketches were interesting, but bizarre. For a boy of his age he did extremely poor work on the Kohs Block Design Test, and seemed to have little sense of balance or proportion. The drawings had suggested that this might be an undiscovered genius, but the test stubbornly refused to indicate even average ability! Upon inquiry it was found that the boy had had four years of instruction under an art teacher who had been both competent and sympathetic. She had had great hopes for him at first, but she had become discouraged when he failed to make any progress. At the end of the four years, he was making exactly the same grotesque sketches that he had been making when he had entered the school. He was content to do the same things over and over, and resented all efforts to get him to master any new technique. The test had not been too far wrong in its diagnosis, after all! The source of the motivation and skill for drawing these few bizarre figures that he dashed off, over and over again in such nonchalant fashion, was never discovered.

Handedness, either right or left, is frequently indicated in questionable cases during work on the speed tests. Whichever hand the patient falls back on in a pinch is likely to prove to be the natively preferred hand. He may use the hand he is supposed to use, or the one he would prefer to use on the basis of conscious choice, but when he gets in a tight place he is likely to use the one with which he feels most adequate.

EXAMINATION OF CASES OF "CONGENITAL WORD BLINDNESS"

In 1917, Hinshelwood published a small volume called "Congenital Word Blindness"⁷ that gave so clear a picture of the individual with a special reading disability, that it is still of value. Fildes,⁸ in 1921, filled in the outlines sketched by Hinshelwood with details obtained in a thoroughgoing piece of research, the results of which were published under

⁷ Hinshelwood, James, *Congenital Word Blindness*. London: H. K. Lewis and Co., 1917.

⁸ Fildes, L. G., "A Psychological Inquiry into the Nature of the Conditions Known as Congenital Word Blindness," *Brain*, XLIV (November, 1921), 286-307.

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the title "A Psychological Inquiry into the Nature of the Conditions Known as Congenital Word Blindness." In 1927, a report was published of "An Attempt to Sort Children with a Specific Reading Disability from Other Non-readers."⁹ Various labels have been suggested for this condition. "Dyslexia" appears to be as good as any, in that it states the condition without attempting to explain the cause.

Recently, attention has been focused upon the non-reading school child, and various methods have been suggested for helping him.

In examining an individual who seems to have some special reading disability, physical and emotional factors receive attention first. When it is time for the psychological examination, a non-verbal scale is needed to determine potential ability, a Binet scale to determine the present level of academic ability, standard achievement tests to find out what has been learned in various school subjects, and an oral vocabulary test. Further testing may be needed to determine the specific type of help that will be required.

Like the stammerer and the color-blind, the individual with a special reading disability is much more likely to be a boy than a girl. He is generally a nice person with a better-than-average adjustment to situations outside the classroom. Before treatment is begun, his rating on the Point Scale of Performance Tests is likely to be higher than his Binet rating, and that, in turn, is likely to be higher than his rating on the oral vocabulary test. Whatever the distribution of scores on the tests of school achievement before treatment, remedial teaching is generally accompanied by a rapid improvement in arithmetic, especially in "story problems." In certain types of cases the learning of the addition, subtraction, and multiplication facts may present serious difficulty. In others they are easily mastered. Reading usually follows arithmetic in rate of improvement. The building of a permanent written vocabulary is a slow process requiring highly skilled teaching, hard work, and great patience on the part of all concerned. Long after satisfactory reading habits are established, spelling may be still so poor that it serves as a permanent reminder that the individual was once a non-reader.

It has been found that the intelligence quotient obtained with Form I of the Point Scale of Performance Tests offers a more reliable basis for predicting what the Binet rating will be after adequate reading habits have been developed, than does a Binet rating obtained for the individual with a specific reading disability before he is taught to read.

⁹ Arthur, Grace, "An Attempt to Sort Children with Specific Reading Disability from Other Non-Readers," *Journal of Applied Psychology*, XI, 4 (August, 1927), 251-264.

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This is best illustrated by Michael, whose case was reported in the *Elementary School Journal* in April, 1940.¹⁰ At the time of the initial examination, Michael was unable to do the work of the sixth grade group in which he was placed because he could neither read nor spell. His chronological age was thirteen years and six months. He earned an average rating on the 1916 edition of the Stanford-Binet scale, with a mental age of thirteen years and eight months, and an IQ of 102.

On Form I of the Point Scale of Performance Tests he earned a superior rating, with an IQ of 120. In spite of this satisfactory level of general ability, he was unable to read aloud a page of the simplest primer material without stumbling. On the Stanford Achievement Tests he earned the following grade standings:

Paragraph Meaning	3.5	Arithmetic Reasoning	4.6
Dictation	3.1	Arithmetic Computation	4.3

The family situation was good. The school was good. The boy was eager to learn. There was no reason to suspect any instability, either emotional or intellectual. All that seemed to be needed was a change in the method of teaching to one that would meet his specific intellectual needs. This proved to be the case. Recovery was rapid as compared with that of other cases of equally severe reading disability. When re-examined eighteen months after the first rating had been obtained, he was able to read fluently any material of ordinary difficulty. He earned a superior rating on the Stanford-Binet scale, with an intelligence quotient of 122. This agreed closely with that initially obtained on the Point Scale of Performance Tests. By that time his grade standings on the Stanford Achievement Tests had reached the following levels:

Paragraph Meaning	5.6	Geography	6.6
Dictation	5.3	Arithmetic Reasoning	7.1
Language Usage	9.2	Arithmetic Computation	7.2
History and Civics	7.5		

An individual handicapped with a special reading disability never reads as well as the average person with the same Binet mental age. Moreover, it should be borne in mind that his Binet rating is lowered

¹⁰ Loudon, Blanche, and Arthur, Grace, "An Application of the Fernald Method to an Extreme Case of Reading Disability," *Elementary School Journal*, XL, 8 (April, 1940), 599-606.

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by the fact that he cannot read, and that his true level of ability is more likely to be revealed by the scale that is less influenced by material learned in the school room.

Because of the intellectual organization characteristic of the dyslexic, he is likely to be at his best in mathematics, mechanical drawing, laboratory courses and shop work, and at a disadvantage in language classes. If foreign language courses are attempted at high school or college level, it should always be with the help of the methods suited to his special needs by means of which he learned to read and write his native language. For although he may be no longer a non-reader, the same intellectual characteristics that made it difficult for him to learn to read and to spell are likely to be retained throughout his life.

EXAMINATION OF THE DEAF

An individual with severely impaired hearing generally accomplishes little or nothing on a Binet test. In written tests, also, he is likely to be at a disadvantage as he seldom gets as good a start in school as the child who has no hearing defect. For the deaf child, therefore, the Point Scale of Performance Tests administered, as it easily can be, without any verbal instructions, is a boon in that it offers him an opportunity to demonstrate without speech the intelligence level at which he is capable of reacting. Moreover, it offers opportunity for the exercise of enough different phases of intellectual activity to enable teachers and parents to understand his individual learning problems as they could not do when testing had to be postponed until a considerable background of academic learning had been acquired.

Shortly after the standardization of the Point Scale of Performance Tests, the Department of Education of St. Paul began a program of testing with Form I all deaf children in the city school system and those with enough impairment of hearing to make them eligible for placement in classes for specialized instruction.

The results of tests given to these children between January, 1929, and May, 1936, were reported in the *Volta Review* by Helen Bishop.¹¹ She states that the children examined constituted "as nearly an unselected group" (from the standpoint of intelligence) "as one can find in the general school population," and further, that "For the ninety children studied, the intelligence quotients on the Arthur Performance Scale

¹¹ Bishop, Helen M., "Performance Scale Tests Applied to Deaf and Hard of Hearing Children," *Volta Review*, XXXVIII, 8 (August, 1936), 447, 484, 485.

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ranged from 152 to 68. The interquartile range was from 84 to 106. The median was 97, the mode 97, and the mean 97.16 for the group."¹²

Judging from these figures, the deaf child was not at too great a disadvantage on this scale, as he was able to accomplish on the average, almost as much as we expect of the average hearing child of the same chronological age. He did this in spite of the fact that he had to grasp what he was supposed to do in the various situations presented without the aid of verbal instructions.

One little six-year-old had been totally deaf from birth, but this did not prevent him from earning an intelligence quotient of 116 on the Point Scale of Performance Tests. We cannot, of course, be sure that this specific child might not have earned an even higher rating if he had been able to hear. But we can be reasonably sure that for an unselected group of ninety deaf and partially deaf children with averages so nearly approaching those obtained for hearing children, the results can be considered fairly reliable.

The testing of five-year-olds with this scale was not recommended for the deaf except in cases where the child seemed to have better than average comprehension.

Thanks to the coöperation of Helen Bishop, the raw data were available and it was possible to analyze scores to see which types of situations presented special difficulties for this group. The Seguin Form Board, the Mare and Foal Test and the Kohs Block Design Test each yielded median mental age scores that were markedly below the median mental age obtained by the group on the scale as a whole. The reason for the difficulty with the Kohs Test was not clear.

It happens that the Seguin Form Board and the Mare and Foal Test are the two tests of the scale that most directly measure speed of reaction. It seemed likely that the idea of getting the blocks back into their places was grasped by these deaf children, but that the idea of speed as an essential feature of the task was not being conveyed to them.

At this point began the search for a gesture that would furnish the non-verbal equivalent for "as fast as you can." Lip reading and speech are stressed in the special classes for children with defective hearing in the city school system; and it was not until Dora Capwell of the Minnesota State Department for Psychological Service undertook a program of testing for the Minnesota State School for the Deaf that this search met with any success. Remaining in the institution for days at a time, she

¹² Bishop, Helen M., *op. cit.*, p. 484.

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became familiar with those children during their free-time activities as well as in the classroom. Since many of them have difficulty in learning to talk and to read lips, they depend upon the manual language of the deaf for friendly conversation out of school hours. Dora Capwell learned that within this group, the idea of "fast" or "quick" was conveyed by a rapid snapping of the thumb against the index finger of the same hand, two or three times in succession. This is illustrated in Figure 1. She was encouraged to use this signal at every point in the scale where "as fast as you can" appears in the verbal instructions. The natural manual sign for "hurry" was not used, as the excited shaking of the hands suggests fluster rather than speed.



FIGURE 1. MANUAL SIGNAL TO THE DEAF TO WORK FAST

As the manual sign used for "as fast as you can" may be different among the deaf of different groups, it would seem to be necessary for the examiner to learn the sign that is used in the group in which he is planning to work. Inasmuch as deaf individuals are often brought into clinics for examination by relatives who are not familiar with the manual signs, it would be a great advantage to have a single manual sign for "fast" decided upon to be taught in all schools and special classes for the deaf and partially deaf. The examiner could then be sure that he was using the manual sign with which his patient was familiar.

Dora Capwell is reporting her findings in a separate article. She states that the girls of the Deaf School tested up to this time included too many who were being examined because of special problems to constitute an unselected group. The sixty boys tested at the State School for the Deaf included some problem cases but not so large a percentage as the girls. Their median chronological age was twelve years and one month, their median mental age on the Point Scale of Performance Tests was ten years and eight months, and the median IQ for the group was 88. The

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median mental age on this performance scale was ten years and five months for the deaf of the Special Class group. From the standpoint of mental age level on the Point Scale of Performance Tests as a whole, therefore, the boys tested at the State School for the Deaf and the total group reported by Helen Bishop from the Special Classes for the Deaf are roughly comparable.

It would seem to be highly significant that the boys tested at the State School for the Deaf were able, with the help of the manual sign that speed was wanted, to earn scores on the Seguin Form Board that averaged three and one-half years of mental age higher than did the deaf of the Special Class group. On the Mare and Foal Test they averaged three years of mental age higher than the Special Class group was able to earn without the aid of a manual sign to indicate speed.

On the other hand, the Porteus Maze Test and the Knox Cube Test seemed to present much more difficulty to the pupils of the State School for the Deaf than to those in the Special Classes for the Deaf of the public school system. It is barely possible that the protecting environment of an institution is less conducive to the development of habits of attention than is the more normal life of children in the city schools.

For the Porteus Maze Test at the lower age levels, there seemed to be difficulty in comprehending the nature of the task. There were so many of the younger children at the State School for the Deaf who failed to earn any score on this test, that it seemed advisable to omit it from the scale in examining deaf children, if the child is still unable to comprehend the task after it has been completely demonstrated according to the instructions in the text. Table VIII can be used for converting total point scores into years and months of mental age when the Porteus Maze Test is omitted.

In examining a child with severely impaired hearing, special care must always be exercised to make sure that he understands what he is expected to do.

On the Knox Cube Test, the examiner needs to be sure that the patient is watching before presenting Series *A*. If the patient fails either Series *A* or *B* the examiner should make sure that he understands the task before proceeding to *C*.

For the Seguin Form Board, the examiner should make sure that the patient is paying attention before the signal to start is given. The manual sign for "fast" with which the patient is familiar should be used. The idea of "hurry" should be avoided, as it tends to reduce speed.

If the Two-Figure Form Board, the Casuist Form Board and the Fea-

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ture-Profile Test are used, the manual sign for "fast" with which the patient is familiar should be utilized.

As the Mare and Foal Test is essentially a speed test, it is especially important that the patient be on the alert and ready to go when the signal is given. The manual sign for "fast" is especially useful in giving this test.

In presenting the Healy Picture Completion Test, the examiner should allow the patient to solve the situation in the practice picture for himself. Whatever suggestions are necessary should be given, but the patient should be allowed to arrive at the conclusion that a wheel is needed for that space, and plenty of time should be given for him to find the wheel and to place the block for himself.

For the Porteus Maze Test, the examiner should note the instructions in the text for use with deaf children: "It is necessary to use the five year maze and sometimes the six year maze as a demonstration form." These are credited as passed if the patient has any success with subsequent mazes.

In using the Kohs Block Design Test with deaf children, the examiner should be sure to use the two trial cards described in the text as practice cards and not as designs to be demonstrated by the examiner. As much time should be given as may be necessary for the patient himself to complete these two designs successfully with whatever suggestions may be needed to get him to comprehend the task. If he fails Design I or II the failure should be recorded, but after the time limit for the design has elapsed, he should be encouraged to complete the design and given whatever suggestions are necessary. This has proved to be more successful than demonstration in helping patients to understand this task. No help should be given after Design II, and no extra practice should be allowed beyond Design II. For all subsequent designs, work must stop promptly when the time limit has elapsed.

Perhaps even more than with most other patients, it is necessary to make the deaf individual feel that he is being accepted and enjoyed as a person and that his work is satisfactory, in order for him to put forth all the effort of which he is capable.

EXAMINATION OF INDIAN SCHOOL CHILDREN

Throughout many years of psychological examining, it was evident that ratings obtained for Indian children had little predictive value. It was of no particular help to get a Binet intelligence quotient in the lower

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nineties for a girl who consistently failed all her school work when she did not try, and just as consistently earned A's and B's when she made any effort.

By analyzing scores and observing habits of work, it was decided to try Form I of the Point Scale of Performance Tests with the two tests omitted that tend to reward rapid trial-and-error reactions. These were the Casuist Form Board, and the Manikin-Feature-Profile Test. Other investigators had suggested that the scale would be strengthened by the omission of some of the form-board material.

On a trip to Haskell Institute, Lawrence, Kansas, another to an Indian health camp at Ponemah, Minnesota, and still another to the Red Lake Indian Reservation in Minnesota, Binet intelligence quotients and ratings on the Revised Form I of the Point Scale of Performance Tests were obtained for twenty-one high school students and thirty-one gradeschool pupils. Ten different tribes were represented in the Haskell group of high school students. In each group, seventy per cent were of full Indian blood or had not more than one-fourth white blood.

The children were coöperative and dependable. Three hours was allowed for each examination, although two and one-half hours often was sufficient. An Indian must not be hurried, if reliable results are to be obtained. He does not like to make a mistake, and often will plan a reaction clear through to its conclusion before making even the first move. On speed tests as such, however, the Indian children equalled or exceeded the norms established for white children of the same chronological ages. It is quite possible that a wilderness environment does not reward impulsive behavior, and that Indians have learned long since that a trial-and-error approach is safest when applied mentally to a new situation. Of this we are sure: they guess reluctantly, even when urged to do so.

The 1916 edition of the Stanford-Binet scale was used, with Terman's correction to yield added mental age units at the upper levels. In calculating intelligence quotients for both scales, a maximum chronological age of 15.0 was used.

On the Stanford-Binet scale, the twenty-one high school pupils earned a median IQ of 94 (Q_1 88, Q_3 96.5). Their reticence put them at a greater disadvantage in tests of the Binet type than in written tests. On the Revised Form I of the Point Scale of Performance Tests, however, the picture was quite different. On this they earned a median IQ of 126 (Q_1 112.5, Q_3 142). It should be remembered that the Point Scale of Performance Tests presents difficulty for many high school students of an

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average city population. The Kohs Block Design Test, which correlates most closely with the Stanford-Binet of any of the tests of this form of the performance scale, requires a high order of ability at the upper levels. On this test the Indian high school students did outstandingly good work.

On the Stanford-Binet scale the thirty-one grade school pupils earned a median IQ of 83 (Q_1 71, Q_3 92). Many of them spoke little English. On the Revised Form I of the Point Scale of Performance Tests they earned a median IQ of 90 (Q_1 80, Q_3 100) in spite of lack of acquaintance with the situations that form the background for the tests. The Healy Picture Completion Test I presented few situations that were familiar to the younger children. With wider environmental experience the Point Scale of Performance Tests ratings tended to increase.

For the younger Indian children, and for those with only wilderness experience and no English, great care should be taken to make sure that the tasks presented by the various tests of the performance scale are understood. If the examiner knows a few words of their own dialect it helps to put them at ease. It is especially useful to know their word for "fast" to use in presenting the tests in which speed is an important factor.

It is useful to remember that Indian children when at ease are as a rule vivacious and fun-loving. The stolid mask which the stranger encounters is assumed for protection against an unknown situation. As they are treated with kindness and respect in their own homes, they respond readily to courtesy and friendliness.

II

THE SCALE: FORM I

FORM I of the Point Scale of Performance Tests was first described in the December 1925 issue of the *Journal of Applied Psychology*.¹ It is made up of the following tests:

1. Knox Cube.
2. Seguin Form Board.
3. Two-Figure Form Board (Pintner).
4. Casuist Form Board (Knox).
5. Manikin (Pintner).
Feature-Profile (Knox and Kempf).
6. Mare and Foal (Healy: modified form).
7. Healy Picture Completion I.
8. Porteus Maze (1924 series).
9. Kohs Block Design.

Of these, the Porteus Maze has been added to the scale since the 1925 report. The Two-Figure Form Board serves the purpose of introducing patients to puzzle-test procedure, and its score is not included in the final rating.

MATERIALS

For the scale in its present form, the materials needed are as follows:

1. Knox Cube. Five one-inch wooden cubes, similar in every respect.
2. Seguin Form Board: Stoelting² catalogue, item No. 27156. Insist upon a properly finished specimen, in which board and insets are smooth to touch. The board should have a dark stain; the insets, a light finish.
3. Two-Figure Form Board: Stoelting catalogue, item No. 27167. It is necessary to examine the parts to make sure that they slip readily into place when similar pieces are interchanged. It is often necessary to smooth one side of a piece with sandpaper to give more play.
4. Casuist Form Board: Stoelting catalogue, item No. 27168. Here again it is necessary to use sandpaper if supposedly interchangeable parts cannot be readily interchanged.

¹ Arthur, Grace, "A New Point Performance Scale," *Journal of Applied Psychology*, IX, 4 (December, 1925), 390-416.

² C. H. Stoelting Company, 424 North Homan Avenue, Chicago, Illinois.

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5. Manikin: Stoelting catalogue, item No. 27170.

Feature-Profile: Stoelting catalogue, item No. 27183.

6. Mare and Foal: Stoelting catalogue, item No. 27154.

7. Healy Picture Completion I: Stoelting catalogue, item No. 34053. The following order for the arrangement of the blocks was fixed upon with the help of Dr. Florence Goodenough, then of the Minneapolis Child Guidance Clinic. For convenience the numbers should be written on the backs of the blocks.

Top row: 1, bucket; 2, m. bottle; 3, wheel; 4, blank; 5, pipe; 6, shoe; 7, dog; 8, purse; 9, b. window; 10, fruit; 11, tie.

Second row from top: 12, cup; 13, knife; 14, chicken; 15, blank; 16, hatchet; 17, blank; 18, basket; 19, blank; 20, pumpkin; 21, blank; 22, s. bird; 23, football; 24, baby.

Third row from top: 25, baseball; 26, cat; 27, blank; 28, candle; 29, bottle; 30, hat; 31, blank; 32, fish; 33, glove; 34, mouse; 35, sprinkling can; 36, blank.

Bottom row: 37, flowers; 38, d. cat; 39, blank; 40, f. bird; 41, books; 42, blank; 43, c. window; 44, clock; 45, scissors; 46, stool; 47, cage; 48, s. cat; 49, log; 50, cherries.

Be sure that the edges of the insets are kept pasted down firmly, as children are quick to see and to select blocks showing signs of much use.

8. Porteus Maze Test: Porteus mazes for five years to Adult II, inclusive (the 1924, not the new series).

9. Kohs Block Design Test: Stoelting catalogue, item No. 37000. On the back of Design II, paste a red one-inch square. On the back of Design I paste a one-inch square, the upper half of which is yellow, and the lower half, red. As the blocks become soiled with use, they can be replaced at small cost with sets obtained from toy departments.

A stop watch: One with a time-out attachment is more useful than one without, in cases where a child, apparently through with his work, goes back to it either to make a minor correction or to wreck the whole thing and start over.

Two pencils with good points and of intriguing newness.

Card or paper for recording scores: We have used ruled filing cards. See Figure 2. Some examiners for their own convenience have used blanks for recording scores on which are displayed the solutions for some of the tasks. For instance, the spaces for the Healy Picture Completion Test have been indicated on these blanks by the name of the correct solution, instead of by number. This has proved to be as convenient for the patient as for the examiner, and has resulted in far too many perfect scores. No keys or guides should be within sight

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James Johnson		Date 5-28-29	Date of birth 10-17-'19	C.A. 9-7	
Grade IV B		Kuhlmann-Binet M.A. 9-6		I.Q. 99	
Test		M.A. Level	Point Value	Kohs	
Knox Cube ABCDEFG...7 } 9.5		10.5	4.46	Score	Design Time
ABCDEFGHIH...8 }				2	I 29"
Seguin 30, 16, 17		9.5	4.48	5	II 24"
Casvist 66"		10.5	4.22		III X
Feature-Profile 59"		> 15.5	4.14	5	IV 1'10
Mare and Foal 39"		8.5	2.44	5	V 1'12
Healy Picture Completion I				5	VI 1'8
1 2* 3 4 5 6 7 8 9 Total		9.5	4.67	8	VIII 29"
cwind — ✓ ✓ blank ✓ ✓ ✓ ✓ 449				5	VII 1'12
				35	
Porteus Maze 5, 5, 7, 8, 9, —, —, — = 9.0		7.5	2.39		IX X
Kohs Block Design 35		9.5	3.85		XI X
Total Point Score			30.65		X X
		M.A.	10-0		
*space not filled		I.Q.	104		

FIGURE 2. SAMPLE SCORE CARD, FORM I

of the patient at any time either during the giving of the scale, or before, or after.

PROCEDURE

The examiner should be seated opposite the patient for the sake of ease in handling the materials. A low table is necessary for the younger children: it is absurd to expect a child who can barely reach the insets of the Seguin Form Board to make a valid score. The Knox cubes are placed on the table. The rest of the materials are placed on the floor beside the examiner in such a position as to be hidden from the patient, when he is seated, by the table. To keep the form boards out of sight until it is time to use them, we have found it convenient to stack the tests in the reverse order of their presentation: Seguin Form Board on the bottom, Two-Figure Form Board next, Casuist Form Board next, Manikin and Feature-Profile in separate boxes next, Healy I next, with the Porteus Maze and Kohs material on top.

In clinic work, the preparation of the patient for the examination is done by the social worker by whom the appointment is made. Children under twelve years of age are told that they are coming to the clinic to play games. Patients over twelve years of age are told that they are going to be given a great many different kinds of tests, so that we can find out which kinds of things they do best. The examiner also makes a differ-

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ent approach to the younger and older patients. After the initial contact in the waiting room is made and it is time to take the child to the examining room (from which all visitors are, of course, excluded), say to the child under twelve, *Let's go into this other room and see what games we can find in there.* To the patient over twelve say: *Let's go into this other room to work.*

When seated at the table, point to the test material on the floor and say: *These all start easy, and they all get hard. When they are easy, don't get caught by thinking they are too easy and getting careless; and when they get hard, remember that no one ever makes a perfect score.* The order in which the tests are presented appears to have a noticeable effect upon the norms. The present order should therefore be adhered to.

(1) *Knox Cube Test.*³ Place four of the cubes two inches apart in a horizontal row in front of the patient. Say: *Watch.* Tap blocks 1, 2, 3, 4, in the order named, with the fifth cube, at the rate of about one tap per second. Begin at the left of the patient.

<i>Patient</i>			
4	3	2	1

Examiner

Put down the fifth cube between 2 and 3, but nearer the patient and say: *You make it touch the same ones that I made it touch.* Present the series in the following order:⁴

A 1234	E 1423	I 14324
B 12343	F 1324	J 142341
C 12342	G 13124	K 132413
D 1432	H 13243	L 143124

For subjects who tend to begin at the opposite end of the row, praise for correct sequence and give full credit, but continue to demonstrate with series A until it is exactly reproduced. Place the fifth block always in the same position before the patient at the end of each series. Older patients often think that the position of this block is part of the test un-

³ Pintner, R., and Paterson, D. G., *A Scale of Performance Tests* (New York: D. Appleton and Company, 1923), p. 68.

⁴ For convenience in scoring, these series, which have been taken from Pintner and Paterson, have been arranged in order of difficulty for our subjects and re-lettered.

THE SCALE: FORM I

less it is kept constant. At the first failure, again caution against careless error. Continue the test through three successive failures.

Repeat in full at the end of the examination, as the last test of the scale. Say: *Let's see if you can do the one with these blocks again, as well as you did the first time.*

Record successes letter by letter, leaving a space for each failure. The score is the average of the two trials, for example, if seven were tapped correctly on the first trial and ten on the second trial, the score would be 8.5.

(2) *Seguin Form Board.* Place the board with the star toward the patient for all three trials. Stack blocks, with the patient watching, in the following order:

At the upper-right corner of the board, from the position of the patient, place the ☆; on that, the ∇, and the ○ on top. In the middle pile, place the ⊕ on the bottom, the ◁ next, then the ∩, and the □ on top. At the upper-left corner of the board, place the ○ at the bottom, then the △, and the □ on top. Say: *This is easy. The game is to see how fast you can do it. When I say "Go," put these back as fast as you can. Ready. Go.* Start the stop watch as soon as the command *Go* is given. Record the time in seconds.

For the second trial say: *That was good. Do you want to try it again? See how much faster you can do it this time. Ready. Go.*

For the third trial say: *Good! It was — seconds faster this time. Try it once more. Perhaps you can do it still faster. Ready. Go.* It is important that the blocks be taken out and stacked by the examiner rapidly, as a leisurely manner largely offsets the instruction to be fast. There should be no suggestion of hurry, however, as this tends to lower speed. Say nothing during a trial, unless, as in the case of some young children, the patient stops work altogether and needs to be encouraged to continue. It is necessary to watch alert patients to make sure that they do not "jump the gun."

Record time for each trial. The shortest time of the three trials is used as the score.

(3) *Two-Figure Form Board.*⁵ The object of this test is to initiate the patient into puzzle-test procedure. It serves as a shock absorber for the young child, and for the nervous, self-distrustful adolescent. The score

⁵ Pintner and Paterson, op. cit., p. 36.

A POINT SCALE OF PERFORMANCE TESTS

is not included in the final rating. Note habits and methods of work for clues to kind and amount of praise necessary to obtain the patient's best effort throughout the remaining tests.

Say: *Turn and look at that picture (behind patient) so that you cannot see while I fix the next game.* This does away with peeping, and does

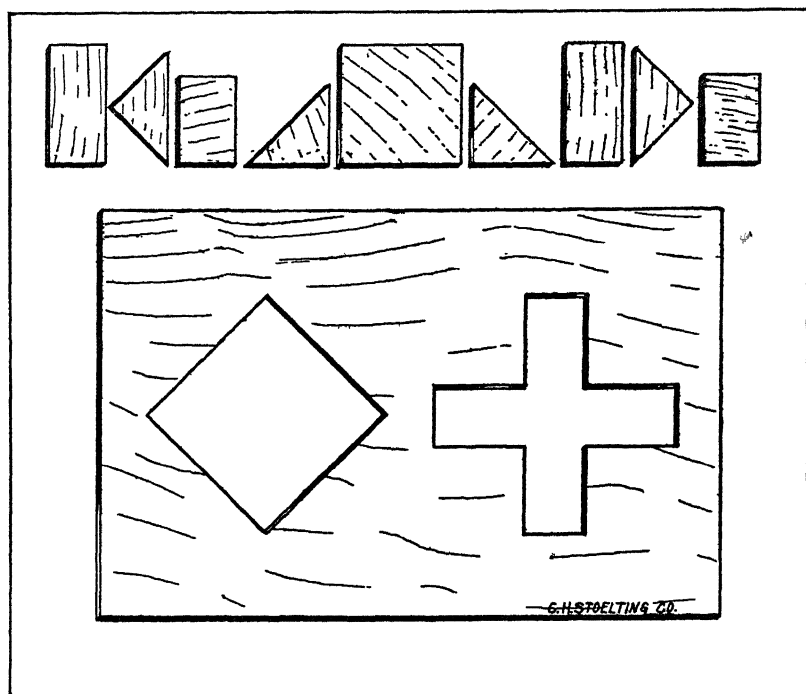


FIGURE 3. TWO-FIGURE FORM BOARD

not meet with resistance from young, nervous children as does closing the eyes. Place the board with the cross at the right of the patient. Arrange the pieces as shown in Figure 3. Have subject again face the table. Say: *Put these back as fast as you can. Ready. Go.*

Allow not more than five minutes. Give help if it is needed, after the time limit is reached.

(4) *Casvist Form Board*.⁶ Say: *Now turn your head again, so that you cannot see.* Place the board with the two small circles toward the patient.

⁶ Pintner and Paterson, op. cit., p. 38.

THE SCALE: FORM I

Arrange the pieces as shown in Figure 4. Have the patient again face the table. Say: *Put these back as fast as you can. Ready. Go.*

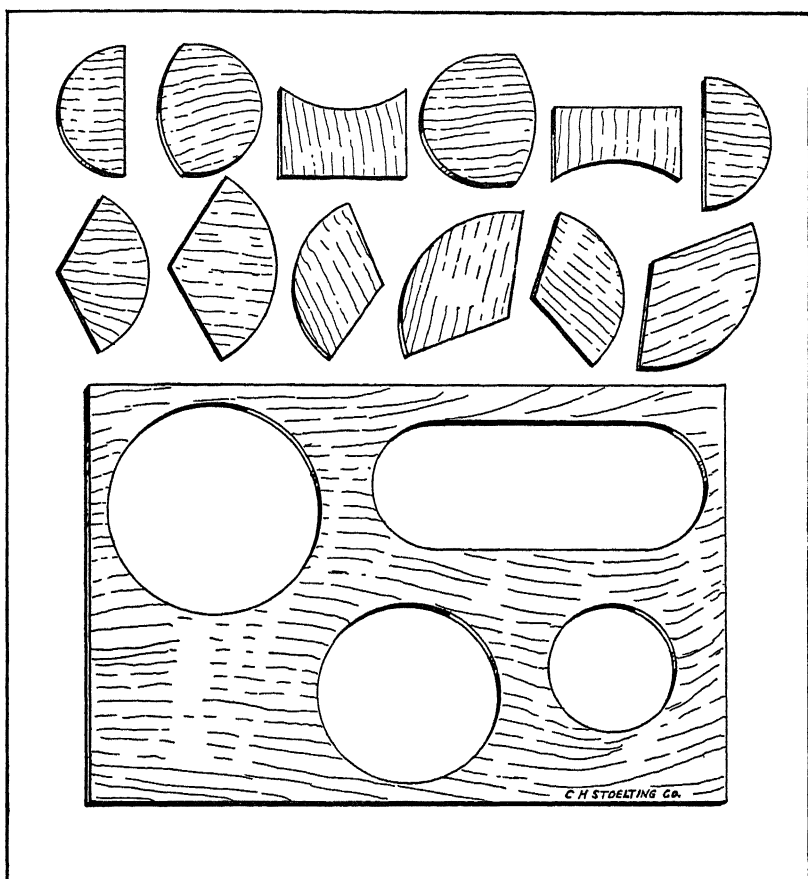


FIGURE 4. CASUIST FORM BOARD

Allow five minutes. Record time in seconds, if the test is completed; if it is not, record the number of forms completed at the end of five minutes.

(5) *Manikin*.⁷ If the patient has passed preceding tests at about the eight year level or better, omit the Manikin and give the Feature-Profile, as success on the Feature-Profile assumes success on the Manikin. If the

⁷ Pintner and Paterson, op. cit., p. 45.

A POINT SCALE OF PERFORMANCE TESTS

Feature-Profile should be failed, however, the Manikin must then be given.

Say: *Turn your head again.* Arrange pieces as shown in Figure 5. Have the patient again face the table. Say: *Now put these together.*

Record results. The following are the commonest solutions, arranged arbitrarily in approximate order of value.

- a. No error.
- b. Both legs going in the same direction. This is common only among the brighter children, and is scored as no error.
- c. One or both arms up or out.
- d. One reversal : arms interchanged or legs interchanged.
- e. Arms interchanged and legs on edge, so that feet point upward.
- f. Legs interchanged and one arm not exactly in socket.
- g. One hand in socket.
- h. Two hands in sockets.
- i. Two reversals : arms interchanged and legs interchanged.
- j. Arms or legs not used.
- k. Legs interchanged or placed in line with outside line of body. Hands in sockets.
- l. One arm and leg interchanged.
- m. Both arms and legs interchanged.
- n. Only the head in place.
- o. Complete failure.

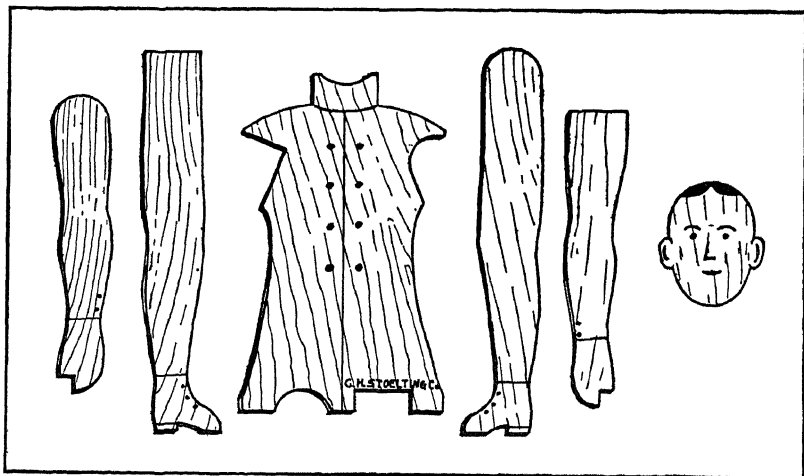


FIGURE 5. MANIKIN

THE SCALE: FORM I

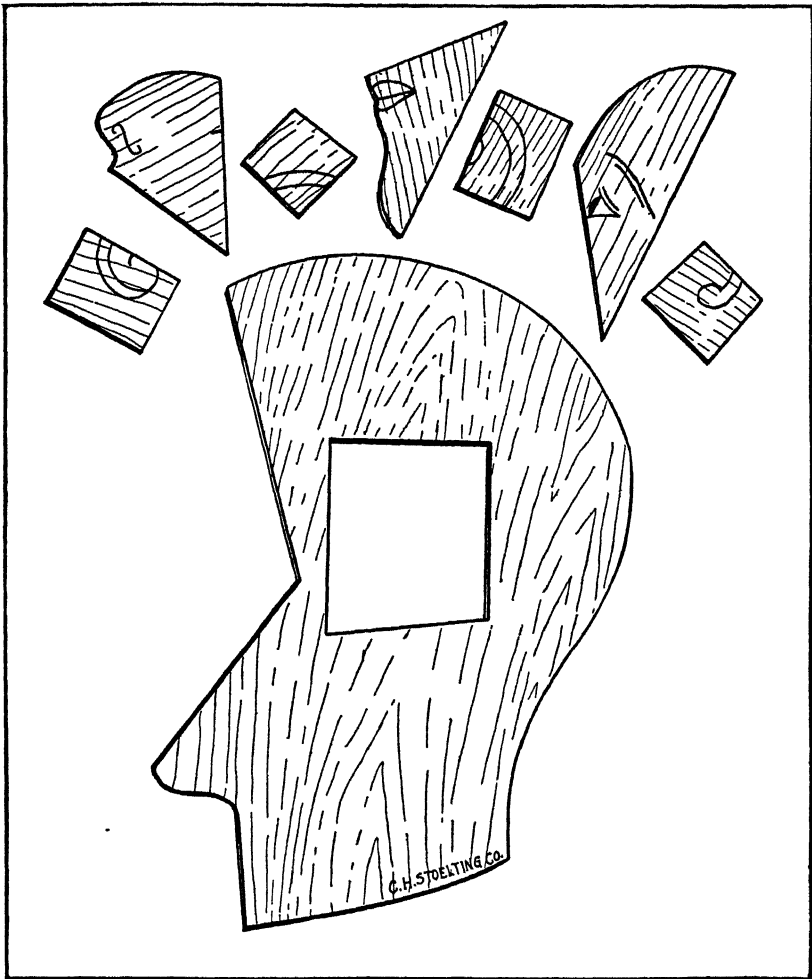


FIGURE 6. FEATURE-PROFILE

*Feature-Profile.*⁸ Omit this test if the patient's score on the Manikin was below *c*. If it is given, say: *Turn your head again.* Arrange the pieces as shown in Figure 6. Say: *Put these together as fast as you can. Ready. Go.* If the patient turns a piece face down, turn it face up again.

Allow five minutes. Record time, if test is completed. If it is not, record partial success as "ear correct" or "profile correct."

⁸ Pintner and Paterson, op. cit., p. 57.

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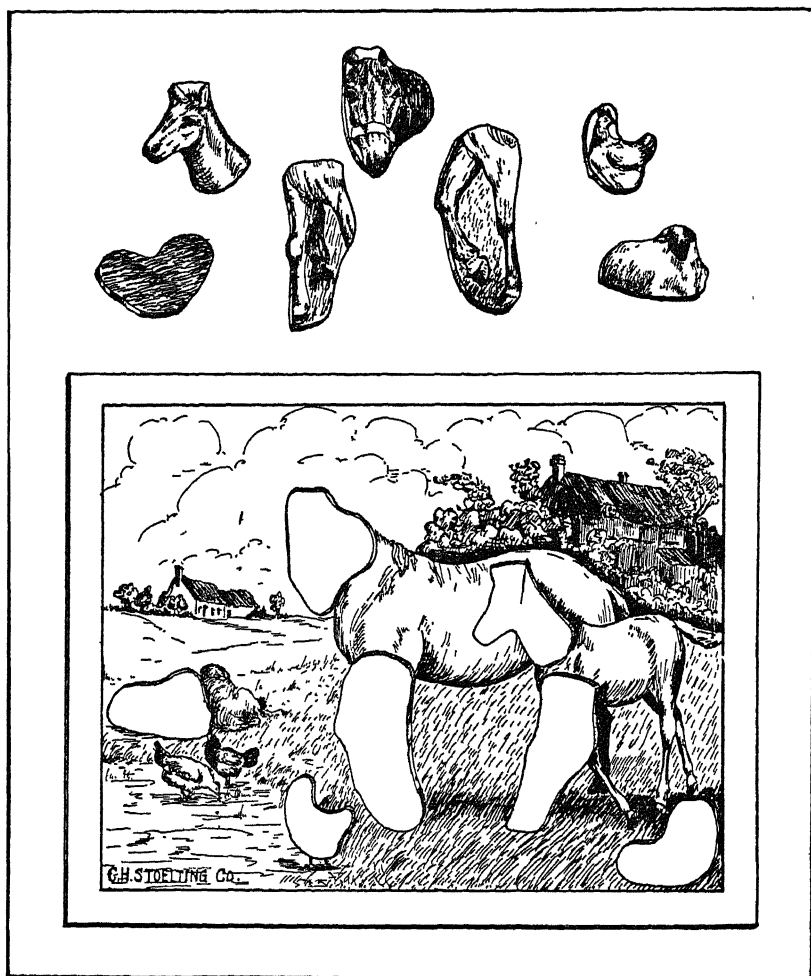


FIGURE 7. MARE AND FOAL

(6) *Mare and Foal.*⁹ Say: *Turn your head again.* Turn the picture face down, with the top edge nearest the examiner. The pieces will fall out, and will be found to be approximately in the order shown in Figure 7, and will need little more than to be turned over. Turn the picture face up and say: *Put these back as fast as you can.*

Record time. The raw score is the time in seconds for completion.

⁹ Pintner and Paterson, op. cit., p. 27.

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(7) *Healy Picture Completion I.*¹⁰ Take the picture from the box and place it before the patient, but leave the blocks covered until instructions have been given, as impulsive patients tend to begin work before they understand what they are to do. Say: *See this picture of all these people doing different things. Parts of the picture are left out. Any one of these blocks (exhibiting them for a moment) will go into any one of these spaces. The game is to find the very best block for each space. Find the block that will make the most sensible picture. Do you see this man? What has he lost?* (Help, if necessary, till the patient comprehends the situation presented in this practice picture.) *All right. You find the wheel. Now you do the others the same way, and find the block for each space that makes the most sensible picture.* If the patient wants to remove a piece in order to substitute another, show him how to push it up from beneath so that he can lift it out more easily.

Allow five minutes. It is often necessary to tell the patient that this is not a speed game. When the patient has finished, if time has not expired, say: *Now look it over and make sure that you have it all just the way you want it.*

Record the blocks in place when the test is completed. Turn the board face down so that the blocks will fall out, and replace the blocks in the box according to their respective numbers.

Score according to the raw score values given in Table I.

(8) *Porteus Maze Test.*¹¹ Begin with the five year maze for all patients. Place it with the number toward the patient. Hold it in position with the tips of the fingers. Hand the patient a pencil. Say: *Suppose you were driving down this road in your automobile. You could get out here, as this is an open road.* (Point to the opening at the end of the fourth road, and indicate without touching the paper the motion of passing out through the open space.) *And you could get out here, as this road is open.* (Point to opening at the end of the sixth road, and again indicate motion of passing out through the open space.) *But there is a fence here. This road is closed.* (Point to the seventh road and to the line across the end of it.) *You couldn't get out here. And this road is closed, and this road is closed, and this road is closed, and this road is closed.* (Point to lines blocking exits to fifth, third, second, and first roads in order.)

¹⁰ Pintner and Anderson, *The Picture Completion Test* (Baltimore: Warwick and York, 1917), p. 58.

¹¹ Porteus, S. D., *Guide to Porteus Maze Test* (Training School, Vineland, N. J., 1924), pp. 20-29.

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TABLE I

Raw Score Values for Healy Picture Completion I

B. WIND. 1		DOG 2		CAT 3	
B. Wind	100	Dog	64	Cat	81
C. Wind	32	Baby	2	Baby	4
Blank	2	Blank	2	Chicken	2
Cage	1	B. Wind	1	Cup	1
		Cat	2	D. Cat	7
		D. Cat	2	Fruit	1
		Hatchet	1	M. Bottle	4
		Mouse	1	F. Bird	2
		S. Bird	1	S. Cat	2
		Stool	1	S. Bird	1
				Stool	1
FOOTBALL 4		HAT 5		BASKET 6	
Football	84	Hat	65	Basket	55
Baseball	21	Baby	3	Bucket	2
Cherries	2	Books	1	Cherries	7
F. Bird	1	Cat	2		
Pumpkin	1	Chicken	1		
		Dog	1		
		F. Bird	1		
		Mouse	2		
		Purse	3		
LOG 7		F. BIRD 8		CHICKEN 9	
Log	52	F. Bird	87	Chicken	58
Blank	1	Basket	2	Baby	1
Hatchet	6	Cage	7	Cat	2
Stool	2	Cherries	3	Cherries	2
		S. Bird	18	Cage	1
				D. Cat	1
				F. Bird	1
				Hatchet	1
				Mouse	1
				S. Bird	2

Maximum score 646.

Now, you take your pencil and show me how you would go down this road (begin at S and make a line not more than one-eighth of an inch long) and drive out the first open road you come to. If the patient fails

THE SCALE: FORM I

by going into a blocked road or by going out the sixth road, a second trial on a new blank is allowed, and the instructions are repeated verbatim.

There are six possibilities which determine the credit for this test:

1. The patient goes out the first open road (fourth road) on the first trial. Full credit, one year.

2. The patient goes out the second open road (sixth road) the first trial, and on the second trial goes out the correct opening. Full credit, one year.

3. The patient goes out the second open road both trials. Half credit, one-half year.

4. The patient goes into a blocked road the first trial and goes out the correct opening the second trial. Half credit, one-half year.

5. The patient goes into a blocked road the first trial and goes out the second opening the second trial. No credit. (The general instructions state that the testing proceeds until there have been two successive failures, but in this case, while no credit is allowed, the test is not counted as a failure in the above sense.)

6. The patient goes into a blocked road both trials. Failure. No credit.

Allow two trials. Record on score card as 5, if full credit was earned, or as 5/2 if half credit was earned. In case of total failure, record with a dash followed by a comma to separate it from the score for the six year maze. Place used mazes directly in the waste basket, or lay them aside, face down.

Place the six year maze before the patient with the number toward him. Say: *Start here* (indicating S) *and drive out here* (point to arrow at the other end) *without getting into any closed roads, and without driving over any fences. You may stop to think any time you like, so long as you keep your pencil still.* Allow two trials. If the patient immediately cuts across a line, he should be stopped and the injunction against crossing lines emphasized. The instructions are repeated verbatim and a second trial is given. Record as 6, 6/2, or —, according to the credit earned: one year for success on the first trial, one-half year for success on the second trial, or zero for failure on both trials.

Place the seven year maze before the patient and say: *Now start here* (pointing to S) *and drive out here* (pointing to arrow) *without going into any closed roads, and without driving over any fences.* Allow two trials. Record as 7, 7/2, or —, according to the credit earned.

Place the eight year maze before the patient. Say: *Start here and find*

A POINT SCALE OF PERFORMANCE TESTS

your way out the open road. Indicate S for the start, but do not point to the exit. If the child asks, "Where is the open road?" say, *You will have to find it for yourself.* If he asks, "Is this the open road?" pointing to the exit, say, *Yes. You could find it for yourself, couldn't you!* Allow two trials. Score as for mazes six and seven.

Repeat the eight year maze procedure with the nine, ten, and eleven year mazes. For the nine year maze give equal credit if either the longer or shorter route out is taken. Repeat this same procedure for the twelve and fourteen year mazes but allow *four trials* for each. Repeat this same procedure for Adult Maze I and II, allowing two trials for each.

Continue testing through two successive failures. Assume a basal age of four years. Add one year for every full credit earned, and one-half year for every half credit earned on mazes five to eleven inclusive. If both the twelve and fourteen year mazes are passed, add together the number of trials taken for both and give additional credit as follows:

<i>Sum of trials in 12 and 14 mazes</i>	<i>Credit to be added to score already obtained on mazes 5 to 11, incl.</i>
2 trials	5 years
3 trials	4 years
4 trials	3 years
5 trials	2½ years
6 trials	2 years
7 trials	1½ years
8 trials	1 year

If the twelve year maze is passed, but the fourteen year maze is failed, credit one year if the twelve year maze is passed on the first, second or third trial; credit one-half year if the twelve year maze is passed on the fourth trial. If the fourteen year maze is passed after the twelve year maze has been failed, credit is given as follows:

<i>14 year maze</i>	<i>Credit to be added to score already obtained</i>
1 trial	2 years
2 trials	1½ years
3 trials	1 year
4 trials	½ year

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For Adult Maze I and II, score as for other two-trial mazes, without penalizing for taking a longer route.

The following precautions should be observed in giving the test:

(a) Do not allow the patient to correct his own error by retracing his course. He should be stopped as soon as an error is made, and given a new test sheet. Say: *You cannot get out that way. Begin again, here.* An error consists in crossing an imaginary line across the opening to a blocked passage. Bringing the patient back to the starting point after an error is intended to impress him with the seriousness of making a mistake. However, no explicit warning as to the need for care should be given. This procedure serves also to safeguard against accidental success up to the point where the previous error occurred.

(b) Never allow the patient more trials than the instructions provide for, even though you do not intend to allow credit for success on the additional trial, as the extra practice may give him an undue advantage on the mazes to be presented later.

(c) Never allow the patient the preliminary practice of tracing the course of the maze in the air with pencil or finger. If the patient persists in doing this, he is told to keep his hands off the table until he is ready to begin to draw.

(d) It is inadvisable to use the same test blank for more than one trial.

(e) Never allow an error to go unpenalized, no matter how slight or how quickly corrected it may be, unless it is very obviously a slip of the pencil due to poor motor control. In tracing the correct course around a maze, the patient may inadvertently run across a line that is not intended as a hazard. This is not penalized. The child is merely warned to *stay in the road*.

(f) The patient should also be warned against lifting the pencil from the paper after a trial is begun. No penalty is attached to this, but the warning is repeated as often as is necessary.

(g) For foreign children or for deaf children it is necessary to use the five year maze and sometimes the six year maze as a demonstration form.

(9) *Kohs Block Design Test*.¹² Take four of the cubes and place them before the patient. Say: *Have you ever seen any blocks like these?* (Note if patient has a set or has ever played with one.) *You see* (or if patient is familiar with them, *You remember*) *they are red on one side* (point), *blue on another* (point), *yellow on another* (point), *and white on an-*

¹² Kohs, S. C., *Intelligence Measurement* (New York: The Macmillan Company, 1923), p. 70.

A POINT SCALE OF PERFORMANCE TESTS

other (point). On this side they are yellow and blue, and on this side they are red and white. All the blocks are just alike: each block is just like every other block.

Place Trial Card 1 before the patient, leaving room between the card and the edge of the table for him to build the design with the blocks. Say: *You take your four blocks and make a big red square like this one.* Give whatever help is necessary either verbally or by putting the blocks into place. Break up the design built of blocks and say, *Now make one just like this*, and present Trial Card 2. Again give whatever help is necessary. Insist upon the design being in correct position.

Present Design I. Say: *Now make this one. This* (pointing to the red) *is supposed to be red, and this* (pointing to the blue) *is supposed to be blue.* This procedure is necessary to keep bright young patients from trying to find colors on the blocks to match those of the design.

The time limit for each design is indicated at the lower left hand corner of the design card. After the time limit has elapsed, give whatever help is necessary for completion of the design. Of course, in such case, no credit is given.

Proceed in similar fashion with Design II. Name the colors of the design. Help, if the design is not completed within the time limit. This extended practice is intended to offset in some measure the advantage possessed by those patients who have had these sets of blocks as toys.

Record time. Score, penalizing for excess time, according to the raw score values given in Table II. Do not count moves or deduct for excess moves. We find no significant difference in discriminative value between scores with errors penalized and scores with excess moves ignored. The decision as to what constitutes a move must be largely individual, and as the performance of some patients is much easier to score in this respect than that of others, we feel that the reliability of the test will be increased by limiting the scoring to time only.

Present designs in the following order: I, II, III, IV, V, VI, VIII, VII, IX, XI, X, XII, XIV, XIII, XV, XVI, XVII. When the designs are presented in this order, we find that the test need be continued through only three successive failures instead of through the five recommended by the Kohs manual. A further saving of time can be effected by having the patient break up the design made of blocks that he has just completed, while the examiner is reaching for the next design to be presented.

The minimum time for giving this performance scale as a whole has

THE SCALE: FORM I

TABLE II
Raw Score Values for Kohs Block Design Test

Design number	Score value	Points to be subtracted for excess time	
		1 point	2 points
I	3	21" and over	
II	5	31" and over	
III	6	21" to 35"	36" and over
IV	7	31" to 1' 0"	1' 1" and over
V	7	36" to 1' 5"	1' 6" and over
VI	7	36" to 1' 0"	1' 1" and over
VII	7	41" to 1' 10"	1' 11" and over
VIII	8	41" to 50"	51" and over
IX	9	56" to 1' 10"	1' 11" and over
X	9	1' 56" to 2' 10"	2' 11" and over
XI	8	1' 46" to 2' 30"	2' 31" and over
XII	9	2' 26" to 2' 40"	2' 41" and over
XIII	9	2' 21" to 2' 33"	2' 34" and over
XIV	9	2' 26" to 2' 40"	2' 41" and over
XV	9	2' 41" to 3' 0"	3' 1" and over
XVI	10	2' 41" to 3' 5"	3' 6" and over
XVII	11	2' 41" to 2' 55"	2' 56" and over

Maximum score 133.

been found to be 35 minutes. The maximum time required for any subject is 90 minutes. The mode falls between 45 minutes and 60 minutes. Undue lengthening of time is more likely to be due to awkwardness of the examiner in handling materials than to slowness of response on the part of the patient. However, when a slow patient is encountered, there is nothing to be done but to give all the time that is needed to obtain an adequate rating.

POINT VALUES AND NORMS

Raw score norms were obtained for each test for age groups five to fifteen years, inclusive. The discriminative value of each test between successive age levels was found by means of the formula,

$$DV = \frac{Av_2 - Av_1}{\frac{PE_2 + PE_1}{2}}$$

TABLE III
Combined Point Scale, Form I

C.A.	Knox I and II		Seguin		Casuist (Time)		Manikin and Feature-Profile		Mare and Foal		Healy I		Maze		Kohs		Total
	Score	Pts.	Score	Pts.	Score	Pts.	Score	Pts.	Score	Pts.	Score	Pts.	Score	Pts.	Score	Pts.	
5.5	3.40	X†	29.95	X	1 correct	X	Man. 1 Rev.*	X	96.31	X	73.21	X	6.15	X	1.53	X	X
6.5	4.90	1.44	25.05	0.79	3 correct	0.98	Man. correct**	0.80	69.71	0.66	159.88	1.31	7.08	0.87	4.95	0.85	7.70
					Correct												
7.5	6.10	2.78	21.50	1.75	215"	1.84	Prof. correct†	1.28	48.69	1.52	254.97	2.42	8.17	1.73	12.37	1.82	15.14
8.5	6.51	3.28	19.10	2.86	128	2.71	Prof. correct†	1.97	39.78	2.35	333.98	3.32	9.25	2.59	19.78	2.78	21.86
							F.P. correct††										
9.5	6.91	3.78	17.33	3.79	96	3.33	204.0	2.66	33.77	3.02	412.98	4.22	10.61	3.43	31.91	3.68	27.91
10.5	7.27	4.21	15.55	4.71	72	3.96	145.0	2.97	30.89	3.44	458.72	4.79	11.97	4.27	43.25	4.28	32.63
11.5	7.49	4.45	14.75	5.27	63	4.35	107.0	3.32	28.00	3.85	504.45	5.36	12.89	4.78	54.58	4.89	36.27
12.5	7.70	4.69	13.94	5.82	57.25	4.66	96.5	3.50	25.72	4.33	522.71	5.64	13.29	5.03	65.77	5.40	39.07
13.5	7.80	4.76	13.41	6.25	51.50	4.97	86.0	3.68	24.12	4.68	536.00	5.85	13.69	5.29	76.95	5.91	41.39
14.5	7.86	4.83	12.88	6.68	45.75	5.28	75.5	3.86	22.74	5.04	548.00	6.06	14.09	5.54	84.29	6.25	43.54
15.5	7.91	4.91	12.47	7.00	40.00	5.58	65.0	4.04	21.36	5.39	560.56	6.27		5.54	91.63	6.58	45.31

† Throughout the tables, X is used to represent an arbitrary zero.

* One reversal.

** Manikin correct.

† Profile or ear correct.

†† Feature-Profile entirely correct.

THE SCALE: FORM I

in which Av_2 is the average of the higher age group, Av_1 is the average of the lower age group, PE_2 is the probable error of the higher group, and PE_1 is the probable error of the lower group.

The values obtained by this formula were regarded as points. The better the test, the greater its discriminative value, and therefore the larger the number of points acquired by it at each age level. By summing these points for any given test, point norms were obtained. By interpolation, point values were found for every possible score occurring between the raw score norms of the test. By extrapolation, point values were also assigned to scores falling outside the range of these norms. The process of test construction is described more fully in Volume II. By summing the point norms of all the tests at each level, total point norms were obtained. This combined scale is presented in Table III.

In Table IV are given point values for all possible scores obtainable on each test. The raw score of the patient on each test is converted into points by means of this table.

These point values are totalled and converted into mental age by reading from Table V. Intelligence quotients are then calculated in the usual manner.

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TABLE IV

For Determining the Point Value of Any Score, Form I

(1) KNOX CUBE TEST

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
Less than								
5.5 yrs.	0.0	—3.26	6.5 yrs.	....	...	12.5 yrs.	....	...
	0.5	—2.78		5.0	1.55		8.0	5.00
	1.0	—2.30		5.5	2.11		8.5	5.53
	1.5	—1.82		6.0	2.67		9.0	6.05
	2.0	—1.34	7.5 yrs.	....	...		9.5	6.58
	2.5	—0.86		6.5	3.28		10.0	7.10
	3.0	—0.38	8.5 yrs.	....	...		10.5	7.62
5.5 yrs.	....	...		7.0	3.89		11.0	8.14
	3.5	+0.10	10.5 yrs.	....	...		11.5	8.67
	4.0	0.58		7.5	4.46		12.0	9.19
	4.5	1.06						

(2) SEGUIN FORM BOARD

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
Less than								
5.5 yrs.	50*	—3.23		32	—0.33		19	2.91
	49	—3.07		31	—0.17		18	3.42
	48	—2.91		30	—0.0	9.5 yrs.	..	...
	47	—2.75	5.5 yrs.	..	...		17	3.95
	46	—2.59		29	+0.15		16	4.48
	45	—2.43		28	0.31	10.5 yrs.	..	...
	44	—2.26		27	0.48		15	5.09
	43	—2.10		26	0.64	11.5 yrs.	..	...
	42	—1.94	6.5 yrs.	..	...		14	5.78
	41	—1.78		25	0.80	12.5 yrs.	..	...
	40	—1.62		24	1.07		13	6.58
	39	—1.46		23	1.34	14.5 yrs.	..	...
	38	—1.30		22	1.61		12	7.36
	37	—1.14	7.5 yrs.	..	...		11	8.14
	36	—0.97		21	1.98		10	8.92
	35	—0.81		20	2.44		9	9.70
	34	—0.65	8.5 yrs.	..	...		8†	10.48
	33	—0.49						

* Deduct 0.1611 for each second above 50.

† Add 0.7804 for each second below 8.

THE SCALE: FORM I

TABLE IV (*Continued*)

(4) CASUIST FORM BOARD

TEST NOT COMPLETED

<i>C.A.</i>	<i>Score</i>	<i>Points</i>
Less than 5.5 yrs.	0	-0.47
5.5 yrs.	1 form correct	X
	2 forms correct	+0.49
6.5 yrs.	3 forms correct	0.98

TEST COMPLETED: TIME SCORE IN SECONDS

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
	300	0.99		268	1.31		236	1.63
	299	1.00		267	1.32		235	1.64
	298	1.01		266	1.33		234	1.65
	297	1.02		265	1.34		233	1.66
	296	1.03		264	1.35		232	1.67
	295	1.04		263	1.36		231	1.68
	294	1.05		262	1.37		230	1.69
	293	1.06		261	1.38		229	1.70
	292	1.07		260	1.39		228	1.71
	291	1.08		259	1.40		227	1.72
	290	1.09		258	1.41		226	1.73
	289	1.10		257	1.42		225	1.74
	288	1.11		256	1.43		224	1.75
	287	1.12		255	1.44		223	1.76
	286	1.13		254	1.45		222	1.77
	285	1.14		253	1.46		221	1.78
	284	1.15		252	1.47		220	1.79
	283	1.16		251	1.48		219	1.80
	282	1.17		250	1.49		218	1.81
	281	1.18		249	1.50		217	1.82
	280	1.19		248	1.51		216	1.83
	279	1.20		247	1.52	7.5 yrs.	215	1.84
	278	1.21		246	1.53		214	1.85
	277	1.22		245	1.54		213	1.86
	276	1.23		244	1.55		212	1.87
	275	1.24		243	1.56		211	1.88
	274	1.25		242	1.57		210	1.89
	273	1.26		241	1.58		209	1.90
	272	1.27		240	1.59		208	1.91
	271	1.28		239	1.60		207	1.92
	270	1.29		238	1.61		206	1.93
	269	1.30		237	1.62		205	1.94

TABLE IV (Continued)
(4) CASUIST FORM BOARD

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
	204	1.95		160	2.39		116	2.94
	203	1.96		159	2.40		115	2.96
	202	1.97		158	2.41		114	2.98
	201	1.98		157	2.42		113	3.00
	200	1.99		156	2.43		112	3.02
	199	2.00		155	2.44		111	3.04
	198	2.01		154	2.45		110	3.06
	197	2.02		153	2.46		109	3.08
	196	2.03		152	2.47		108	3.10
	195	2.04		151	2.48		107	3.12
	194	2.05		150	2.49		106	3.13
	193	2.06		149	2.50		105	3.15
	192	2.07		148	2.51		104	3.17
	191	2.08		147	2.52		103	3.19
	190	2.09		146	2.53		102	3.21
	189	2.10		145	2.54		101	3.23
	188	2.11		144	2.55		100	3.25
	187	2.12		143	2.56		99	3.27
	186	2.13		142	2.57		98	3.29
	185	2.14		141	2.58		97	3.31
	184	2.15		140	2.59	9.5 yrs.	96	3.33
	183	2.16		139	2.60		95	3.35
	182	2.17		138	2.61		94	3.38
	181	2.18		137	2.62		93	3.41
	180	2.19		136	2.63		92	3.43
	179	2.20		135	2.64		91	3.46
	178	2.21		134	2.65		90	3.48
	177	2.22		133	2.66		89	3.51
	176	2.23		132	2.67		88	3.54
	175	2.24		131	2.68		87	3.56
	174	2.25		130	2.69		86	3.59
	173	2.26		129	2.70		85	3.62
	172	2.27	8.5 yrs.	128	2.71		84	3.64
	171	2.28		127	2.73		83	3.67
	170	2.29		126	2.75		82	3.69
	169	2.30		125	2.77		81	3.72
	168	2.31		124	2.79		80	3.75
	167	2.32		123	2.81		79	3.77
	166	2.33		122	2.83		78	3.80
	165	2.34		121	2.85		77	3.83
	164	2.35		120	2.86		76	3.85
	163	2.36		119	2.88		75	3.88
	162	2.37		118	2.90		74	3.90
	161	2.38		117	2.92		73	3.93

TABLE IV (Continued)
(4) CASUIST FORM BOARD

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
10.5 yrs.	72	3.96	13.5 yrs.	...	...		31	6.06
	71	4.00		51	4.99		30	6.11
	70	4.05		50	5.04		29	6.17
	69	4.09		49	5.10		28	6.22
	68	4.13		48	5.15		27	6.27
	67	4.18		47	5.20		26	6.33
	66	4.22		46	5.26		25	6.38
	65	4.26	14.5 yrs.	...	...		24	6.43
11.5 yrs.	64	4.31		45	5.31		23	6.49
	63	4.35		44	5.36		22	6.54
	62	4.40	15.5 yrs.	43	5.42		21	6.59
	61	4.44		42	5.47		20	6.65
	60	4.51		41	5.52		19	6.70
	59	4.56		40	5.58		18	6.75
12.5 yrs.	58	4.62		39	5.63		17	6.81
	...	...		38	5.69		16	6.86
	57	4.67		37	5.74		15	6.91
	56	4.72		36	5.79		14	6.97
	55	4.78		35	5.85		13	7.02
	54	4.83		34	5.90		12	7.07
	53	4.88		33	5.95		11	7.13
	52	4.94		32	6.01		10*	7.18

* Add 0.0534 for each second decrease in time score.

(5) MANIKIN AND FEATURE-PROFILE

In assigning point values, the Manikin and Feature-Profile have been treated as a single test. If either the profile or the ear of the Feature-Profile is completed, the point value assigned to that performance on that test becomes the point score for the Manikin-Feature-Profile Test as a whole. For example, if the Manikin is

<i>C.A.</i>	<i>Score</i>	<i>Points</i>
Less than		
5.5 yrs.	Complete failure	-1.60
	Manikin head correct	-1.20
	2 reversals, Manikin	-0.80
5.5 yrs.	1 reversal, Manikin	X
	One or both arms up or out	+0.40
6.5 yrs.	Manikin correct	0.80
7.5 yrs.	Ear or profile correct	1.28
8.5 yrs.	Ear or profile correct	1.28

TABLE IV (*Continued*)
(5) MANIKIN AND FEATURE-PROFILE

FEATURE-PROFILE COMPLETED: TIME SCORE IN SECONDS

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
	300	2.18		267	2.34		234	2.51
	299	2.18		266	2.35		233	2.51
	298	2.19		265	2.35		232	2.52
	297	2.19		264	2.36		231	2.52
	296	2.20		263	2.36		230	2.53
	295	2.20		262	2.37		229	2.53
	294	2.21		261	2.37		228	2.54
	293	2.21		260	2.38		227	2.54
	292	2.22		259	2.38		226	2.55
	291	2.22		258	2.39		225	2.55
	290	2.23		257	2.39		224	2.56
	289	2.23		256	2.40		223	2.56
	288	2.24		255	2.40		222	2.57
	287	2.24		254	2.41		221	2.57
	286	2.25		253	2.41		220	2.58
	285	2.25		252	2.42		219	2.58
	284	2.26		251	2.42		218	2.59
	283	2.26		250	2.43		217	2.59
	282	2.27		249	2.43		216	2.60
	281	2.27		248	2.44		215	2.60
	280	2.28		247	2.44		214	2.61
	279	2.28		246	2.45		213	2.61
	278	2.29		245	2.45		212	2.62
	277	2.29		244	2.46		211	2.62
	276	2.30		243	2.46		210	2.63
	275	2.30		242	2.47		209	2.63
	274	2.31		241	2.47		208	2.64
	273	2.31		240	2.48		207	2.64
	272	2.32		239	2.48		206	2.65
	271	2.32		238	2.49		205	2.65
	270	2.33		237	2.49	9.5 yrs.	204	2.66
	269	2.33		236	2.50		203	2.66
	268	2.34		235	2.50		202	2.67

completed and either the ear or the profile of the Feature-Profile Test is correct, the point score for the Manikin-Feature-Profile Test is 1.28. If the Manikin is completed and the Feature-Profile is completed in 300 seconds, the point score for the Manikin-Feature-Profile Test as a whole is 2.18, the point value given in Table IV for completing the Feature-Profile in 300 seconds.

TABLE IV (*Continued*)
(5) MANIKIN AND FEATURE-PROFILE

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
	201	2.68		158	2.90		115	3.25
	200	2.68		157	2.91		114	3.26
	199	2.69		156	2.91		113	3.27
	198	2.69		155	2.92		112	3.27
	197	2.70		154	2.93		111	3.28
	196	2.70		153	2.93		110	3.29
	195	2.71		152	2.94		109	3.30
	194	2.71		151	2.94		108	3.31
	193	2.72		150	2.95	11.5 yrs.	107	3.32
	192	2.72		149	2.95		106	3.34
	191	2.73		148	2.96		105	3.35
	190	2.73		147	2.96		104	3.37
	189	2.74		146	2.97		103	3.39
	188	2.74	10.5 yrs.	145	2.97		102	3.41
	187	2.75		144	2.98		101	3.42
	186	2.76		143	2.99		100	3.44
	185	2.76		142	3.00		99	3.46
	184	2.77		141	3.01		98	3.47
	183	2.77		140	3.02		97	3.49
	182	2.78		139	3.03	12.5 yrs.	...	...
	181	2.78		138	3.03		96	3.51
	180	2.79		137	3.04		95	3.53
	179	2.79		136	3.05		94	3.54
	178	2.80		135	3.06		93	3.56
	177	2.80		134	3.07		92	3.58
	176	2.81		133	3.08		91	3.59
	175	2.81		132	3.09		90	3.61
	174	2.82		131	3.10		89	3.63
	173	2.82		130	3.11		88	3.64
	172	2.83		129	3.12		87	3.66
	171	2.83		128	3.13	13.5 yrs.	86	3.68
	170	2.84		127	3.14		85	3.70
	169	2.85		126	3.15		84	3.71
	168	2.85		125	3.16		83	3.73
	167	2.86		124	3.16		82	3.75
	166	2.86		123	3.17		81	3.76
	165	2.87		122	3.18		80	3.78
	164	2.87		121	3.19		79	3.80
	163	2.88		120	3.20		78	3.82
	162	2.88		119	3.21		77	3.83
	161	2.89		118	3.22		76	3.85
	160	2.89		117	3.23	14.5 yrs.	...	...
	159	2.90		116	3.24		75	3.87

TABLE IV (Continued)
(5) MANIKIN AND FEATURE-PROFILE

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
15.5 yrs.	74	3.88		55	4.21		36	4.53
	73	3.90		54	4.23		35	4.55
	72	3.92		53	4.24		34	4.57
	71	3.94		52	4.26		33	4.59
	70	3.95		51	4.28		32	4.60
	69	3.97		50	4.29		31	4.62
	68	3.99		49	4.31		30	4.64
	67	4.00		48	4.33		29	4.65
	66	4.02		47	4.35		28	4.67
	65	4.04		46	4.36		27	4.69
	64	4.06		45	4.38		26	4.71
	63	4.07		44	4.40		25	4.72
	62	4.09		43	4.41		24	4.74
	61	4.11		42	4.43		23	4.76
	60	4.12		41	4.45		22	4.77
	59	4.14		40	4.47		21	4.79
	58	4.16		39	4.48		20*	4.81
	57	4.18		38	4.50			
	56	4.19		37	4.52			

* Add 0.0171 for each second decrease in time score.

(6) MARE AND FOAL

TIME SCORE IN SECONDS

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
Less than 5.5 yrs.				136	—0.98		121	—0.61
	150*	—1.33		135	—0.96		120	—0.59
	149	—1.31		134	—0.93		119	—0.56
	148	—1.28		133	—0.91		118	—0.54
	147	—1.26		132	—0.89		117	—0.51
	146	—1.23		131	—0.86		116	—0.49
	145	—1.21		130	—0.84		115	—0.46
	144	—1.18		129	—0.81		114	—0.44
	143	—1.16		128	—0.79		113	—0.41
	142	—1.13		127	—0.76		112	—0.39
	141	—1.11		126	—0.74		111	—0.36
	140	—1.08		125	—0.71		110	—0.34
	139	—1.06		124	—0.69		109	—0.32
	138	—1.03		123	—0.66		108	—0.29
	137	—1.01		122	—0.64		107	—0.27

* Deduct 0.0248 for each second increase in time score.

TABLE IV (*Continued*)

(6) MARE AND FOAL

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
	106	—0.24		71	0.63		38	2.55
	105	—0.22		70	0.66		37	2.66
	104	—0.19	6.5 yrs.	...	...		36	2.77
	103	—0.17		69	0.70		35	2.88
	102	—0.14		68	0.74		34	2.99
	101	—0.12		67	0.78	9.5 yrs.	...	...
	100	—0.09		66	0.82		33	3.13
	99	—0.07		65	0.86		32	3.27
	98	—0.04		64	0.91		31	3.42
	97	—0.02		63	0.95	10.5 yrs.	...	...
5.5 yrs.	...	...		62	0.99		30	3.56
	96	+0.01		61	1.03		29	3.71
	95	0.03		60	1.07	11.5 yrs.	28	3.85
	94	0.06		59	1.11		27	4.06
	93	0.08		58	1.15		26	4.27
	92	0.11		57	1.19	12.5 yrs.	..	....
	91	0.13		56	1.23		25	4.49
	90	0.16		55	1.27	13.5 yrs.	..	...
	89	0.18		54	1.31		24	4.71
	88	0.21		53	1.36		23	4.97
	87	0.23		52	1.40	14.5 yrs.	..	...
	86	0.26		51	1.44		22	5.23
	85	0.28		50	1.48	15.5 yrs.	..	...
	84	0.31		49	1.52		21	5.49
	83	0.33	7.5 yrs.	...	...		20	5.74
	82	0.35		48	1.58		19	6.01
	81	0.38		47	1.68		18	6.27
	80	0.40		46	1.77		17	6.52
	79	0.43		45	1.86		16	6.78
	78	0.45		44	1.96		15	7.04
	77	0.48		43	2.05		14	7.30
	76	0.50		42	2.14		13	7.56
	75	0.53		41	2.24		12	7.82
	74	0.55		40	2.33		11	8.08
	73	0.58	8.5 yrs.	...	...		10*	8.34
	72	0.60		39	2.44			

* Add 0.257 for each second decrease in time score.

TABLE IV (*Continued*)
(7) HEALY PICTURE COMPLETION I

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
Less than 5.5 yrs.	0	-1.10		43	-0.46		85	0.18
	1	-1.09		44	-0.44		86	0.19
	2	-1.08		45	-0.43		87	0.21
	3	-1.06		46	-0.41		88	0.22
	4	-1.04		47	-0.40		89	0.24
	5	-1.03		48	-0.38		90	0.25
	6	-1.01		49	-0.37		91	0.27
	7	-1.00		50	-0.35		92	0.28
	8	-0.98		51	-0.34		93	0.30
	9	-0.97		52	-0.32		94	0.31
	10	-0.95		53	-0.31		95	0.33
	11	-0.94		54	-0.29		96	0.34
	12	-0.92		55	-0.28		97	0.36
	13	-0.91		56	-0.26		98	0.37
	14	-0.89		57	-0.24		99	0.39
	15	-0.88		58	-0.23		100	0.40
	16	-0.86		59	-0.21		101	0.42
	17	-0.84		60	-0.20		102	0.43
	18	-0.83		61	-0.18		103	0.45
	19	-0.82		62	-0.17		104	0.46
	20	-0.80		63	-0.15		105	0.48
	21	-0.79		64	-0.14		106	0.50
	22	-0.77		65	-0.12		107	0.51
	23	-0.76		66	-0.11		108	0.53
	24	-0.74		67	-0.09		109	0.54
	25	-0.73		68	-0.08		110	0.56
	26	-0.71		69	-0.06		111	0.57
	27	-0.70		70	-0.05		112	0.59
	28	-0.68		71	-0.03		113	0.60
	29	-0.67		72	-0.02		114	0.62
	30	-0.65		73	-0.00		115	0.63
	31	-0.64	5.5 yrs.	...	...		116	0.65
	32	-0.62		74	+0.00		117	0.66
	33	-0.61		75	0.03		118	0.68
	34	-0.59		76	0.04		119	0.69
	35	-0.58		77	0.06		120	0.71
	36	-0.56		78	0.07		121	0.72
	37	-0.55		79	0.09		122	0.74
	38	-0.53		80	0.10		123	0.75
	39	-0.52		81	0.12		124	0.77
	40	-0.50		82	0.13		125	0.78
	41	-0.49		83	0.15		126	0.80
	42	-0.47		84	0.16		127	0.81

TABLE IV (Continued)
(7) HEALY PICTURE COMPLETION I

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
	128	0.83		171	1.44		215	1.95
	129	0.84		172	1.45		216	1.96
	130	0.86		173	1.46		217	1.97
	131	0.87		174	1.47		218	1.98
	132	0.89		175	1.48		219	1.99
	133	0.90		176	1.50		220	2.00
	134	0.92		177	1.51		221	2.02
	135	0.93		178	1.52		222	2.03
	136	0.95		179	1.53		223	2.04
	137	0.96		180	1.54		224	2.05
	138	0.98		181	1.55		225	2.06
	139	0.99		182	1.57		226	2.07
	140	1.01		183	1.58		227	2.09
	141	1.02		184	1.59		228	2.10
	142	1.04		185	1.60		229	2.11
	143	1.05		186	1.61		230	2.12
	144	1.07		187	1.62		231	2.13
	145	1.08		188	1.63		232	2.14
	146	1.10		189	1.65		233	2.16
	147	1.11		190	1.66		234	2.17
	148	1.13		191	1.67		235	2.18
	149	1.14		192	1.68		236	2.19
	150	1.16		193	1.69		237	2.20
	151	1.17		194	1.70		238	2.21
	152	1.19		195	1.71		239	2.23
	153	1.20		196	1.73		240	2.24
	154	1.22		197	1.74		241	2.25
	155	1.23		198	1.75		242	2.26
	156	1.25		199	1.76		243	2.27
	157	1.27		200	1.77		244	2.28
	158	1.28		201	1.78		245	2.29
	159	1.30		202	1.80		246	2.31
6.5 yrs.	...	...		203	1.81		247	2.32
	160	1.31		204	1.82		248	2.33
	161	1.32		205	1.83		249	2.34
	162	1.33		206	1.84		250	2.35
	163	1.34		207	1.85		251	2.36
	164	1.36		208	1.87		252	2.38
	165	1.37		209	1.88		253	2.39
	166	1.38		210	1.89		254	2.41
	167	1.39		211	1.90	7.5 yrs.	...	...
	168	1.40		212	1.91		255	2.42
	169	1.41		213	1.92		256	2.43
	170	1.43		214	1.94		257	2.44

TABLE IV (*Continued*)
(7) HEALY PICTURE COMPLETION I

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
	258	2.45		302	2.95		345	3.44
	259	2.47		303	2.96		346	3.46
	260	2.48		304	2.97		347	3.47
	261	2.49		305	2.99		348	3.48
	262	2.50		306	3.00		349	3.49
	263	2.51		307	3.01		350	3.50
	264	2.52		308	3.02		351	3.51
	265	2.53		309	3.03		352	3.52
	266	2.54		310	3.04		353	3.53
	267	2.56		311	3.05		354	3.55
	268	2.57		312	3.06		355	3.56
	269	2.58		313	3.08		356	3.57
	270	2.59		314	3.09		357	3.58
	271	2.60		315	3.10		358	3.59
	272	2.61		316	3.11		359	3.60
	273	2.62		317	3.12		360	3.61
	274	2.63		318	3.13		361	3.63
	275	2.65		319	3.14		362	3.64
	276	2.66		320	3.15		363	3.65
	277	2.67		321	3.17		364	3.66
	278	2.68		322	3.18		365	3.67
	279	2.69		323	3.19		366	3.68
	280	2.70		324	3.20		367	3.69
	281	2.71		325	3.21		368	3.70
	282	2.73		326	3.22		369	3.72
	283	2.74		327	3.23		370	3.73
	284	2.75		328	3.24		371	3.74
	285	2.76		329	3.26		372	3.75
	286	2.77		330	3.27		373	3.76
	287	2.78		331	3.28		374	3.77
	288	2.79		332	3.29		375	3.78
	289	2.80		333	3.30		376	3.79
	290	2.82	8.5 yrs.	...	...		377	3.81
	291	2.83		334	3.32		378	3.82
	292	2.84		335	3.33		379	3.83
	293	2.85		336	3.34		380	3.84
	294	2.86		337	3.35		381	3.85
	295	2.87		338	3.37		382	3.86
	296	2.88		339	3.38		383	3.87
	297	2.89		340	3.39		384	3.89
	298	2.91		341	3.40		385	3.90
	299	2.92		342	3.41		386	3.91
	300	2.93		343	3.42		387	3.92
	301	2.94		344	3.43		388	3.93

TABLE IV (*Continued*)
(7) HEALY PICTURE COMPLETION I

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
	389	3.94		432	4.46		475	4.99
	390	3.95		433	4.47		476	5.00
	391	3.96		434	4.48		477	5.01
	392	3.98		435	4.49		478	5.03
	393	3.99		436	4.51		479	5.04
	394	4.00		437	4.52		480	5.05
	395	4.01		438	4.53		481	5.06
	396	4.02		439	4.54		482	5.08
	397	4.03		440	4.55		483	5.09
	398	4.04		441	4.57		484	5.10
	399	4.05		442	4.58		485	5.11
	400	4.07		443	4.59		486	5.13
	401	4.08		444	4.60		487	5.14
	402	4.09		445	4.62		488	5.15
	403	4.10		446	4.63		489	5.16
	404	4.11		447	4.64		490	5.17
	405	4.12		448	4.65		491	5.19
	406	4.13		449	4.67		492	5.20
	407	4.14		450	4.68		493	5.21
	408	4.16		451	4.69		494	5.22
	409	4.17		452	4.70		495	5.24
	410	4.18		453	4.72		496	5.25
	411	4.19		454	4.73		497	5.26
	412	4.20		455	4.74		498	5.27
9.5 yrs.	...	...		456	4.75		499	5.29
	413	4.22		457	4.77		500	5.30
	414	4.23		458	4.78		501	5.31
	415	4.24	10.5 yrs.	...	...		502	5.32
	416	4.26		459	4.79		503	5.34
	417	4.27		460	4.80		504	5.35
	418	4.28		461	4.82	11.5 yrs.	...	...
	419	4.29		462	4.83		505	5.36
	420	4.31		463	4.84		506	5.38
	421	4.32		464	4.85		507	5.39
	422	4.33		465	4.86		508	5.41
	423	4.34		466	4.88		509	5.42
	424	4.36		467	4.89		510	5.44
	425	4.37		468	4.90		511	5.45
	426	4.38		469	4.91		512	5.47
	427	4.39		470	4.93		513	5.48
	428	4.41		471	4.94		514	5.50
	429	4.42		472	4.95		515	5.51
	430	4.43		473	4.96		516	5.53
	431	4.44		474	4.98		517	5.54

TABLE IV (Continued)
(7) HEALY PICTURE COMPLETION I

C.A.	Score	Points	C.A.	Score	Points	C.A.	Score	Points
12.5 yrs.	518	5.56	15.5 yrs.	...	...		604	6.98
	519	5.57		561	6.27		605	7.00
	520	5.59		562	6.28		606	7.02
	521	5.60		563	6.30		607	7.03
	522	5.62		564	6.32		608	7.05
	...	...		565	6.34		609	7.07
	523	5.64		566	6.35		610	7.08
	524	5.66		567	6.37		611	7.10
	525	5.67		568	6.39		612	7.12
	526	5.69		569	6.40		613	7.13
	527	5.71		570	6.42		614	7.15
	528	5.72		571	6.44		615	7.17
	529	5.74		572	6.45		616	7.18
	530	5.76		573	6.47		617	7.20
	531	5.77		574	6.49		618	7.22
13.5 yrs.	532	5.79		575	6.50		619	7.23
	533	5.81		576	6.52		620	7.25
	534	5.82		577	6.54		621	7.27
	535	5.84		578	6.55		622	7.28
	536	5.85		579	6.57		623	7.30
	537	5.87		580	6.59		624	7.32
	538	5.89		581	6.60		625	7.33
	539	5.91		582	6.62		626	7.35
	540	5.92		583	6.64		627	7.37
	541	5.94		584	6.65		628	7.38
	542	5.96		585	6.67		629	7.40
	543	5.97		586	6.69		630	7.42
	544	5.99		587	6.70		631	7.43
	545	6.01		588	6.72		632	7.45
	546	6.02		589	6.74		633	7.47
14.5 yrs.	547	6.04		590	6.75		634	7.48
	548	6.06		591	6.77		635	7.50
	549	6.07		592	6.79		636	7.52
	550	6.09		593	6.80		637	7.53
	551	6.10		594	6.82		638	7.55
	552	6.12		595	6.84		639	7.57
	553	6.14		596	6.85		640	7.58
	554	6.15		597	6.87		641	7.60
	555	6.17		598	6.89		642	7.62
	556	6.19		599	6.90		643	7.63
	557	6.20		600	6.92		644	7.65
	558	6.22		601	6.93		645	7.67
	559	6.24		602	6.95		646	7.68
	560	6.25		603	6.97			

TABLE IV (Continued)
(8) PORTEUS MAZE TEST

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
Less than				9.0	2.39	12.5 yrs.	...	...
5.5 yrs.	4.0	-2.01	8.5 yrs.	...	...		13.5	5.17
	4.5	-1.54		9.5	2.74	13.5 yrs.	...	...
	5.0	-1.08		10.0	3.05		14.0	5.48
	5.5	-0.61		10.5	3.36	14.5 yrs.	...	...
	6.0	-0.14	9.5 yrs.	...	...		14.5	5.79
5.5 yrs.	...	...		11.0	3.67		15.0	6.10
	6.5	+0.33		11.5	3.98		15.5	6.42
	7.0	0.80	10.5 yrs.	...	...		16.0	6.73
6.5 yrs.	...	...		12.0	4.29		16.5	7.04
	7.5	1.20		12.5	4.57		17.0	7.35
	8.0	1.59	11.5 yrs.	...	...		17.5	7.67
7.5 yrs.	...	...		13.0	4.85		18.0	7.98
	8.5	1.99						

(9) KOHS BLOCK DESIGN TEST

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
Less than				20	2.80		43	4.28
5.5 yrs.	0	-0.38		21	2.87	10.5 yrs.	...	...
	1	-0.13		22	2.95		44	4.33
5.5 yrs.	...	...		23	3.02		45	4.38
	2	+0.12		24	3.10		46	4.44
	3	0.37		25	3.17		47	4.49
	4	0.62		26	3.24		48	4.54
6.5 yrs.	...	...		27	3.32		49	4.60
	5	0.86		28	3.39		50	4.65
	6	0.99		29	3.47		51	4.70
	7	1.12		30	3.54		52	4.76
	8	1.25		31	3.61		53	4.81
	9	1.38	9.5 yrs.	...	...		54	4.86
	10	1.51		32	3.69	11.5 yrs.	...	...
	11	1.64		33	3.74		55	4.92
	12	1.77		34	3.80		56	4.97
7.5 yrs.	...	...		35	3.85		57	5.01
	13	1.90		36	3.90		58	5.06
	14	2.03		37	3.96		59	5.10
	15	2.16		38	4.01		60	5.15
	16	2.29		39	4.06		61	5.19
	17	2.42		40	4.12		62	5.24
	18	2.55		41	4.17		63	5.28
	19	2.68		42	4.22		64	5.33
8.5 yrs.	...	...				

TABLE IV (Continued)
(9) KOHS BLOCK DESIGN TEST

<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>	<i>C.A.</i>	<i>Score</i>	<i>Points</i>
12.5 yrs.	65	5.38	15.5 yrs.	87	6.37		111	7.45
	...	...		88	6.42		112	7.50
	66	5.42		89	6.46		113	7.54
	67	5.47		90	6.51		114	7.59
	68	5.51		91	6.55		115	7.63
	69	5.56		...	...		116	7.67
	70	5.60		92	6.60		117	7.72
	71	5.65		93	6.64		118	7.76
	72	5.69		94	6.69		119	7.81
	73	5.74		95	6.73		120	7.85
13.5 yrs.	74	5.78	15.5 yrs.	96	6.78		121	7.90
	75	5.83		97	6.82		122	7.94
	76	5.88		98	6.87		123	7.99
	...	...		99	6.91		124	8.03
	77	5.92		100	6.96		125	8.08
	78	5.97		101	7.00		126	8.12
	79	6.01		102	7.05		127	8.17
	80	6.06		103	7.09		128	8.21
	81	6.11		104	7.14		129	8.26
	82	6.15		105	7.18		130	8.30
14.5 yrs.	83	6.20		106	7.23		131	8.35
	84	6.24		107	7.27		132	8.39
	...	...		108	7.32		133	8.44
	85	6.28		109	7.36			
	86	6.33		110	7.41			

TABLE V
For Converting Total Point Scores into Years and Months of Mental Age, Form I

Years	Months											
	0	1	2	3	4	5	6	7	8	9	10	11
4	-11.54	-10.90	-10.26	-9.62	-8.98	-8.34	-7.70	-7.06	-6.42	-5.78	-5.13	-4.49
5	-3.85	-3.21	-2.57	-1.93	-1.28	-0.64	X	0.64	1.28	1.93	2.57	3.21
6	3.85	4.49	5.13	5.78	6.42	7.06	7.70	8.32	8.94	9.56	10.18	10.80
7	11.42	12.04	12.66	13.28	13.90	14.52	15.14	15.70	16.26	16.82	17.38	17.94
8	18.50	19.06	19.62	20.18	20.74	21.30	21.86	22.36	22.87	23.37	23.88	24.38
9	24.89	25.39	25.89	26.40	26.90	27.41	27.91	28.30	28.70	29.09	29.48	29.88
10	30.27	30.66	31.06	31.45	31.84	32.24	32.63	32.93	33.24	33.54	33.84	34.15
11	34.45	34.75	35.06	35.36	35.66	35.97	36.27	36.50	36.74	36.97	37.20	37.44
12	37.67	37.90	38.14	38.37	38.60	38.84	39.07	39.26	39.46	39.65	39.84	40.04
13	40.23	40.42	40.62	40.81	41.00	41.20	41.39	41.57	41.75	41.93	42.11	42.29
14	42.46	42.64	42.82	43.00	43.18	43.36	43.54	43.69	43.84	43.98	44.13	44.28
15	44.43	44.57	44.72	44.87	45.02	45.16	45.31	45.46	45.61	45.75	45.90	46.05
16	46.20	46.34	46.49	46.64	46.79	46.93	47.08	47.23	47.38	47.52	47.67	47.82
17	47.97	48.11	48.26	48.41	48.56	48.70	48.85					

NOTE: The point scores in italics are extrapolated. Above the extrapolated norm for 17 years 6 months, add one month of mental age for each .15 (.1475) increase in total point score; or add one year of mental age for each 1.77 increase in total point score.

III

THE SCALE: ABRIDGMENTS OF FORM I

OMISSION OF CASUIST FORM BOARD AND MANIKIN-FEATURE-PROFILE TEST

EARLY in the history of the Point Scale of Performance Tests, a number of psychologists suggested that the scale seemed to be somewhat overweighted with form-board material. The Casuist Form Board, the Manikin-Feature-Profile Test and the Mare and Foal Test showed poor discriminative value as compared with other tests of the scale, the Manikin-Feature-Profile, perhaps, being the least useful.

As time went on, erratic ratings were often found to result from exceptional scores, either high or low, on the Casuist Form Board, or even more often, on the Manikin-Feature-Profile Test. In some cases an erratic score on one of these tests would be offset by an equally erratic score on the other, falling in the opposite direction. It had been observed that the patient who stopped to think out his procedure before he began to react was likely to make a poorer score on these two tests than the impulsive, hyperactive individual who trusted largely to rapid trial and error. Moreover, the Manikin-Feature-Profile Test has been the subject of most of the requests for additional information about directions for giving and scoring.

It seemed desirable, therefore, to study results when the Casuist Form Board and the Manikin-Feature-Profile Test are omitted from the total score.

A group of cases was assembled that seemed to represent as normal a sampling as one would be likely to find in a clinic case load: there were no deaf, blind, spastic, or dyslexic individuals included, and none with either acute emotional disturbance at the time of the examination or any involvement of the central nervous system.

The Point Scale of Performance Tests and the Binet scale had, as a rule, been given in immediate succession. The performance material had almost always been presented first, as this had proved to be good clinical procedure. In some cases this probably had resulted in a lower score on the performance material than if the patient had had an opportunity to become familiar with the clinic situation before this material was presented. However, so many children have built up a feeling of inadequacy around their school situations that maximum effort was probably more

THE SCALE: ABRIDGMENTS OF FORM I

nearly approximated by following this procedure than if the Binet scale with its question and answer situations had been presented first in half of the cases as standard research technique would suggest.

Table VI A shows average ratings for the group on the Binet scale, on Form I of the Point Scale of Performance Tests, and for the Abridged Form I with the Casuist Form Board and the Manikin-Feature-Profile Test omitted from the total score, for each chronological age level from five to sixteen years inclusive, and for an adult group. Table VI B gives the median algebraic difference between IQs obtained with (a) the Binet scale and Form I, (b) the Binet scale and the Abridged Form I, and (c) Form I and the Abridged Form I, and the median arithmetic difference for each pair of ratings compared.

From the data presented, the scale does not seem to be greatly improved by the omission of these two tests from the total score. On the other hand, so far as this group of cases is concerned, and considering averages rather than individual situations, the scale appears to work almost as well with these two tests omitted from the total score.

Table VII is presented for converting total point scores into mental

TABLE VI A

*Comparison of Intelligence Quotients on Binet, Performance Scale
Form I, and Abridged Form I Omitting Casuist Form Board
and Manikin-Feature-Profile Test*

C.A.	No. of Cases	Binet IQs			Form I IQs			Abridged Form I IQs		
		Q ₁	M	Q ₃	Q ₁	M	Q ₃	Q ₁	M	Q ₃
5	19	99	105	111	91	100	111	93	103	113
6	57	93.5	99	107	89	102	109	89.5	98	110
7	75	94	102	113	92	102	116	92	101	112
8	97	91	101	110.5	88.5	101	110	88	98	111
9	101	95	102	109	90.5	101	108.5	89	100	111
10	81	84	98	110.5	84	96	108.5	84.5	96	107.5
11	87	83	93	105	81	90	105	78	91	104
12	91	82	97	106	84	97	114	85	97	118
13	70	81	90	101	83	96	109	83	92	114
14	89	81	89	97	77	90	105	78	91	107
15	64	86	95	106	89	106.5	121	86	109.5	128.5
16	74	83	92.5	101	87	101.5	113	86	99	117
Adult	69	86	97	105	89	99	120.5	87.5	100	126

TABLE VI B

*Median and Quartile Differences between Intelligence Quotients on
Binet, Performance Scale Form I, and Abridged Form I*

Differences were arranged in algebraic order for finding these crude medians and quartiles. If the second of the two IQs compared was higher than the first, the difference was recorded as +; if it was lower, it was recorded as -. In the third set of comparisons, if the second IQ was closer to the Binet IQ than the first, the difference was recorded as +; if it was farther from the Binet IQ than the first, it was recorded as -. The PEs were calculated by the Otis formula.

C.A.	No. of Cases	Binet IQs vs. Form I IQs			Binet IQs vs. Abr. Form I			Form I IQs vs. Abr. Form I			PEs		
		Q ₁	M	Q ₃	Q ₁	M	Q ₃	Q ₁	M	Q ₃	Binet vs. Form I	Binet vs. Abr. Form I	Form I vs. Abr. Form I
5	19	-9	-2	+2	-12	-1	+3	-3	0	+1	4.24	5.65	1.41
6	57	-6	+2	+7	-8	0	+5.5	-3.5	0	+4	4.24	4.24	2.83
7	75	-4	0	+6	-5	+1	+5	-2	0	+3	3.53	3.53	1.41
8	97	-10	0	+5	-4	-1	+4	-2	0	+2	3.53	3.53	1.41
9	101	-8	0	+5	-8	-2	+6	-4	0	+2	4.24	4.95	2.12
10	81	-8.5	0	+6.5	-8	0	+7	-3	0	+3	4.95	4.95	2.12
11	87	-8	-2	+6	-9	-2	+8	-3	-1	+3	4.95	6.36	2.12
12	91	-3	+5	+13	-4	+4	+14	-4	-1	+3	6.36	6.36	2.12
13	70	-2	+2.5	+12	-4	+2	+14	-4	-1	+1	4.24	5.65	1.41
14	89	-6	0	+7	-6	+4	+12	-4	-1	+2	4.95	7.77	2.12
15	64	-3.5	+7	+20.5	-6.5	+9	+25.5	-7	-2.5	+1	8.48	10.95	2.83
16	74	0	+6	+19	-2	+8	+20	-6	-1	+2	7.77	8.48	2.83
Adult	69	-3.5	+4	+18	-5	+5	+21	-5	-2	+3	5.65	7.07	2.12

TABLE VII

*For Converting Total Point Scores into Mental Ages for Abridged Form I Omitting Casuist Form Board
and Manikin-Feature-Profile Test*

Years	Months											
	0	1	2	3	4	5	6	7	8	9	10	11
4	-8.88	-8.89	-7.89	-7.40	-6.91	-6.41	-5.92	-5.42	-4.93	-4.44	-3.94	-3.45
5	-8.96	-8.47	-1.97	-1.48	-.99	-.49	X	.49	.99	1.48	1.97	2.47
6	2.96	3.45	3.94	4.44	4.93	5.42	5.92	6.43	6.94	7.44	7.95	8.46
7	8.97	9.48	9.99	10.49	11.00	11.51	12.02	12.45	12.88	13.31	13.74	14.17
8	14.60	15.03	15.46	15.89	16.32	16.75	17.18	17.56	17.97	18.37	18.76	19.16
9	19.55	19.95	20.34	20.74	21.13	21.53	21.92	22.24	22.55	22.87	23.18	23.50
10	23.81	24.13	24.44	24.76	25.07	25.39	25.70	25.94	26.18	26.42	26.67	26.91
11	27.15	27.39	27.63	27.87	28.12	28.36	28.60	28.79	28.99	29.18	29.37	29.56
12	29.76	29.95	30.14	30.33	30.53	30.72	30.91	31.06	31.22	31.37	31.52	31.67
13	31.83	31.98	32.13	32.28	32.44	32.59	32.74	32.88	33.02	33.15	33.29	33.43
14	33.57	33.71	33.85	33.98	34.12	34.26	34.40	34.51	34.62	34.72	34.83	34.94
15	35.05	35.15	35.26	35.37	35.48	35.58	35.69	35.80	35.91	36.01	36.12	36.23
16	36.33	36.44	36.55	36.66	36.76	36.87	36.98	37.09	37.20	37.30	37.41	37.52
17	37.63	37.73	37.84	37.95	38.06	38.16	38.27					

NOTE: The point scores in italics are extrapolated. Above the extrapolated norm for 17 years 6 months, add one month of mental age for each .1075 increase in total point score; or add one year of mental age for each 1.29 increase in total point score.

TABLE VIII
For Converting Total Point Scores into Mental Ages for Form I Omitting Porteus Maze Test

Years	Months											
	0	1	2	3	4	5	6	7	8	9	10	11
4	-10.85	-9.68	-9.11	-8.54	-7.97	-7.40	-6.83	-6.26	-5.69	-5.12	-4.45	-3.98
5	-9.41	-8.85	-8.28	-7.71	-7.14	-6.57	X	.57	1.14	1.71	2.28	2.85
6	3.41	3.98	4.45	5.12	5.69	6.26	6.83	7.38	7.93	8.47	9.02	9.57
7	10.12	10.67	11.22	11.76	12.31	12.86	13.41	13.90	14.39	14.88	15.37	15.85
8	16.34	16.83	17.32	17.81	18.30	18.79	19.27	19.70	20.14	20.57	21.01	21.44
9	21.87	22.31	22.74	23.18	23.61	24.05	24.48	24.80	25.13	25.45	25.77	26.10
10	26.42	26.74	27.07	27.39	27.71	28.04	28.36	28.62	28.88	29.14	29.40	29.66
11	29.92	30.19	30.45	30.71	30.97	31.23	31.49	31.70	31.92	32.13	32.34	32.55
12	32.77	32.98	33.19	33.40	33.62	33.83	34.04	34.21	34.38	34.55	34.73	34.90
13	35.07	35.24	35.41	35.58	35.76	35.93	36.10	36.26	36.42	36.57	36.73	36.89
14	37.05	37.21	37.37	37.52	37.68	37.84	38.00	38.15	38.30	38.44	38.59	38.74
15	38.89	39.03	39.18	39.33	39.48	39.62	39.77	39.92	40.07	40.21	40.36	40.51
16	40.66	40.80	40.95	41.10	41.25	41.39	41.54	41.69	41.84	41.98	42.13	42.28
17	42.43	42.57	42.72	42.87	43.02	43.16	43.31					

NOTE: The point scores in italics are extrapolated. Above the extrapolated norm for 17 years 6 months, add one month of mental age for each .1475 increase in total point score; or add one year of mental age for each 1.77 increase in total point score.

THE SCALE: ABRIDGMENTS OF FORM I

ages, when the Casuist Form Board and Manikin-Feature-Profile Test are omitted from the scale.

From Table VI B it is clear that for the median difference between the Binet and these performance scale ratings, as well as for the difference between the medians, there is no constant tendency for individuals to score either higher or lower on the performance material than on the Binet until the 15 year level is reached.

It is, of course, impossible to determine from these figures what effect the giving of the Casuist and the Manikin-Feature-Profile tests had upon the scores of subsequent tests of the scale. As the tasks are different in character, it can be assumed tentatively that the principal effect would be that of additional time for adjustment to the total situation.

If any tests are to be omitted from the Point Scale of Performance Tests for the sake of saving time, the Casuist Form Board and the Manikin-Feature-Profile Test would seem to be the safest to omit.

OMISSION OF PORTEUS MAZE TEST

As stated in Chapter I, in the section on the examination of the deaf, it seems advisable to omit the Porteus Maze Test in testing some deaf children in the lower age levels who are unable to comprehend the task even after repeated demonstration. Table VIII is, therefore, presented for converting point scores into mental ages, when the Porteus Maze Test is omitted from the scale.

WHEN OTHER TESTS ARE OMITTED

It happens at times that a score on some test is rendered invalid for one reason or another: a stop watch refuses to start, the child runs to the window to see a fire engine, or some other interruption occurs. Obviously, there should be a way to calculate a rating from the valid scores that were obtained.

Let us suppose that a successful examination has been given up to the Mare and Foal picture completion test. At this point, a hitherto well-behaved stop watch suddenly refuses to move. The child completes the test, and you praise him. As you have long since lost all faith in stop watches and are prepared for such emergencies, the examination proceeds without interruption. You have no score for the Mare and Foal Test, but you obtain a total point score from the remaining tests in the usual manner.

A POINT SCALE OF PERFORMANCE TESTS

The patient earned 23.81 points. Consulting Table III we see that this would have to fall between the total point score for the 8.5 year and that of the 9.5 year level. From this same table we see that the point norm for the Mare and Foal Test at the 8.5 year level is 2.35. For the 9.5 year level it is 3.02. Subtracting these values from the total point norms of their respective levels, we now have a new total point score at the 8.5 year level of 19.51 (21.86 — 2.35) and a new total point score at the 9.5 year level of 24.89 (27.91 — 3.02). The distance between these two new total point norms is 5.38 points.

The child's total point score of 23.81 falls 4.30 points above the derived 8.5 year total point score of 19.51. This will yield a mental age, therefore, of 8.5 years, plus $4.30/5.38$, or $8.5 + .799$ years, or approximately nine years and three months (9.299 years).

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